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WHEN some of the officers of a railway have grafting relations with supply companies, that railway is not the only company that is hurt thereby. Competing supply concerns, which otherwise would have a chance to get business from the railway, are injured, both directly and also indirectly in that the whole *morale* of the supply business is affected. Supplymen would rather be honest than not. This sounds like such negative praise as to be damning; but it really sums up the situation, and is, at least, in contrast to the idea that they delight in sin for its own sake. For disclosures of grafting such as those which have taken place on the Illinois Central reflect discredit not only on railway officers generally, but also on supply concerns generally, the innocent suffering in reputation along with the guilty. As a result of the notoriety given to the Illinois Central frauds the public has got the idea that business transactions between railways and supply concerns are usually tainted by fraud. Honest railway officers and honest railway supply men are too much disposed to look and comment with cynical indifference on improper relations between railway officers and supply concerns. If they had good reason to think that some railway officer or some railway supply man was picking the pockets of his friends or cheating them at cards they would regard and talk about him in a very different way. Is not "grafting" an offence that is equally bad and deserving of contempt? A railway officer occupies a position of trust. He is usually paid reasonably well for the performance of his duties to the road. For him to work for his own profit instead of for the profit of his employer is an infamous betrayal of trust; and the supply man who in any way, directly or indirectly, bribes a railway officer to violate his obligation to his railway is equally guilty with him.

"GOV. DRAPER has been urging the Boston & Maine to give better service and lower milk rates. This is in accordance with the recognized policy of this commonwealth. Massachusetts has no desire to own the railways but the state does retain the power to insist on such service as the needs of patrons demand, so far as this may be done without confiscation of private property." This is from the *Boston Advertiser*. The declaration of policy might be paraphrased by saying that the state does not desire to own the railways and that this is because railways ought not to pay any interest on the money invested in them. If the state goes as far as it can without confiscating the railways it will reduce transportation rates until the dividends realized by the stockholders are, say, one-half of one per cent. Probably it is fair to assume that in advocating a policy which would come next door to confiscation this editor was simply careless. He did not mean to be so radical as that. But these extreme statements by otherwise fair minded writers are just what the political demagogue thrives on. Mr. Mellen seems to be pursuing a liberal policy with the state of Massachusetts in this matter; and it is to be hoped that some at least of the newspapers are willing to let him make a living profit.

THE fact that the first attempt to construct a bridge across the St. Lawrence river at Quebec resulted in a disaster made no difference in the decision that such a bridge should be built. The investigation into the causes of the failure had not been completed before it was generally understood that it would be rebuilt. This was followed by an elaborate series of tests as to the strength of large members, which has resulted in a redesigning of those for the new structure, and it is thought that work is sufficiently advanced on the plans for construction to be continued without interruption to the end. The drawings for the superstructure have been so far completed that invitations for bids have been sent out, which will be opened on the first of October, when it is expected that proposals will be received from prominent builders in both America and Europe. The contracts to be let at that time will probably amount to about $10,000,000. In the meantime contracts have been let for the removal of the debris of the old bridge, and a large amount of contractors' material is already on the ground for the prosecution of the work on the north pier, an attempt being made to get it above the water level before the end of this season. The responsibility for the new structure has been assumed by the Department of Railways and Canals for the Dominion of Canada, which has retained H. E. Vautelet, of Montreal, as

chief engineer, Maurice Fitzmaurice, of London, and Ralph Modjeska, of Chicago, as a board of engineers in charge of construction. The new bridge, like the old, will provide for two railway tracks, two trolley tracks, two highways and two sidewalks, all on the same level. It is the intention, however, to proportion the details not only for higher live loads but for lower unit stresses, which will add materially to the weight of the structure. The total load is about twice that of the old one that failed, but is so designed that the bottom chords, for example, have a strength about five times as great. As compared with the Forth bridge, it will be called on to sustain a load more than four times as heavy, and it is expected that the total weight of the whole will be between 74,000 and 75,000 tons. The new designs call for a superstructure 3,232 ft. long between the anchorages, with three short approach and three main spans. The main channel span has a length of 1,818 ft. and the suspended span one of 586 ft. In the erection one of two methods may be employed. The cantilever trusses are designed to permit of a cantilever erection of the suspended span, but it is also possible that the latter may be erected independently, floated to position and then raised to place. One of the principal changes made in the design is that the top and bottom chords of the cantilevers are straight. The depth of these over the piers is about 236 ft., while that of the suspended span is about 110 ft. Another change is to make a greater width between trusses, by which a greater stability will be secured, and this has involved the reconstruction of the piers, which must, of necessity, be longer than before. The calculations have been based on the results of tests to destruction of models of the chords and of nickel steel eyebars which have shown a uniformity of failure and behavior under stress, establishing the correctness of the estimates that have been made for the new work.

THE BIG RAILWAYS AND THE LITTLE RAILWAYS.

THE action of the Interstate Commerce Commission in ordering that the operation of the tariffs that the trunk lines have filed, canceling the allowances that they have been paying to the so-called "tap lines," shall be postponed until January 5, 1911, and announcing that the commission will enter on a general investigation of the question of the reasonableness and legality of the step which the roads propose to take, indicates that this subject is going to receive the very thorough consideration that it ought to have before it is finally settled. The fundamental prerequisite to a fair decision as to what roads should be given tap line allowances, it would seem, is a classification of the various lines owned by industrial corporations according to the nature of the services they render. That a little line, having only a very few miles of track and perhaps only one or two engines, which is owned by an industrial concern, and which does nothing but switch the products or the raw materials of this concern within the limits of its works or forests, is not a common carrier, no matter how it may try to hold itself out as such, is self-evident. It is no more a common carrier than would be a team and truck which the industry used to haul its raw materials and products to and from an adjacent railway station.

But, suppose that this little railway, while remaining in the ownership of an industrial corporation, not only offers to serve other individuals and concerns, but actually begins to handle traffic for all who tender it. What does it become then? This, for example, is the case with the Manufacturers' Railway of St. Louis, a letter from whose president, George F. Moore, we print in another column. It was originally organized and is still owned by one of the large brewing companies of St. Louis. At first it did a switching business only for this company. Subsequently, other industries were located on its lines, for which it also did switching. It published tariffs, filed them with the Interstate Commerce Commission, and, in short, did everything that a common carrier does except transport passengers. This is the case also with many of the logging railways in the Southwest. Suppose, further, that while continuing to be owned by an industrial corporation and to haul its products to junctions with trunk line railways, the road develops, as has the Louisiana & Arkansas, which is owned by the Buchanan lumber interests, into a railway having 255 miles of track, 28 locomotives and 1,251 cars, and doing a general freight and passenger business. What has it become then, and to what extent has it acquired a right to demand that through rates be made with it by the large connecting lines? These queries, we think, indicate the real nature of the question to be settled by the commission. It has got to be determined in the case of each tap line whether, not as a matter of law, but as a matter of fact, it is a common carrier. No doubt no line which is not a common carrier in fact is entitled to make through rates in connection with a common carrier. The queries also indicate how difficult it is going to be for the commission to draw the exact line which will separate the sheep from the goats. The tap line railway proper develops by such insensible gradations into a railway which actually is a common carrier that to say when it has ceased to be the one and begun to be the other will often tax a mind capable of making the finest and aptest distinctions. Yet in every instance this distinction must be drawn if injustice is to be avoided.

While it is of fundamental importance to make an accurate classification of lines owned by industrial concerns, according to whether they are or are not true common carriers, the task of fixing equitable relations between lines which are controlled by industrial corporations and the trunk line railways will not be finished when this is done. Reverting to the case of the Manufacturers' Railway of St. Louis: Formerly the trunk lines absorbed the switching charges that it made; in other words, fixed the same through rates from points on its lines as from points on their own lines in St. Louis and paid it out of the through rate for the switching services it rendered. After the Interstate Commerce Commission made its tap line ruling in the Star Grain & Lumber Company case, the trunk lines canceled the rates which they had made in connection with the Manufacturers' Railway, and they now charge their full St. Louis rates from their junctions with it. The consequence is that industrial concerns located on the Manufacturers' Railway alone have to pay switching charges to the Manufacturers' Railway, in addition to the through rates, while concerns located on the tracks of the trunk lines in St. Louis have to pay only the through rates. This obviously puts the shipper who is located only on the Manufacturers' Railway at a disadvantage as compared with one who is located on the tracks of the trunk lines. This is the gravamen of Mr. Moore's complaint.

Exactly the same thing is true of a shipper of lumber in the Southwest who is located on a tap line which he does not own, and from which the trunk line withdraws tap line allowances. A blanket rate of 18 cents is made on lumber from all points west of the Mississippi river and south of Little Rock, Ark., to St. Louis. In other words, the 18-cent rate is "blanketed" from Little Rock to the Gulf of Mexico, a distance of about 400 miles. Now, if any shipper of lumber in this territory is located on a trunk line his rate to St. Louis will continue to be but 18 cents, but if he is located on a tap line his rate will be the trunk line's rate of 18 cents plus whatever the tap line charges him for getting his lumber to the trunk line. The tap line allowances have averaged from 2 to 6 cents. One of the tap lines which carries on a general transportation business is the Tremont & Gulf, which has a mileage of over 100 miles. There are three or four large lumber mills located on it which are not owned by the same interests that control the road. If the trunk lines charged their full 18-cent rate from their junctions with it, and it charged the independent shipper rates equal to the allowances which the trunk lines have given it in the past, the sum of the rates which some of these shippers would have to pay to St. Louis would be as much as 24 cents, although other shippers located much farther from St. Louis, but on the tracks of the trunk lines themselves, would be paying but 18 cents. It is evident, therefore, that the mere cancellation of the tariffs which have been in effect would not put the relation between the trunk

lines and the small railways and shippers located on them on an equitable basis.

On the other hand, the difficulties in the way of securing implicit obedience to the provisions of the Interstate Commerce act prohibiting unjust discriminations, when trunk line railways are allowed to make rate allowances to railways owned by shippers are known to all persons familiar with the history of past railway regulation in this country. All the earnings of the Manufacturers' Railway of St. Louis ultimately find their way into the treasury of the brewing company that controls it. It is perfectly evident that if no restrictions were put on the amount that the trunk lines could pay to it for the switching services it renders, they might, through it, pay to the brewing company enormous rebates, not only in the form of excessive allowances for the services which the Manufacturers' Railway renders in delivering the brewing company's effervescent products to the trunk lines, but also in the form of excessive allowances for the services that it renders in switching goods to the trunk lines from other industries located on its tracks. That unfair discrimination has been and is now effected by improper divisions of rates between trunk lines and railways owned by large shippers is only too well known.

The commission, therefore, has before it the task not only of classifying the railways owned by industrial corporations as common carriers or otherwise, but also of determining on what bases it is reasonable and equitable for the trunk lines to divide their through rates with common carriers owned by industrial corporations. It may be said that the only way to prevent the unfair discrimination which is apt to grow out of the ownership of railways by industrial corporations having a large traffic to give to the trunk lines is to prohibit such ownership. But, while it may be constitutional to prohibit a railway from engaging in any business but transportation, it pretty certainly would not be constitutional to prohibit an industrial corporation from owning stock in a railway sufficient to control it, unless this prohibition were made in pursuance of some provision in the industrial company's charter. Probably the law could ordinarily no more prohibit a private corporation from owning stock in a railway than it could prohibit a private individual from doing so.

Whatever action the government takes to prevent unfair discrimination in such cases must apply not to the ownership of the railway but directly to its rates. What is a proper division of a through rate when given to a railway owned by an industrial corporation for the transportation of commodities belonging to that industrial corporation is, like the question of whether a line is or is not a common carrier, a question of fact. No doubt the best criterion would be what the trunk line would ordinarily concede to a short line not owned by an industrial corporation for rendering similar services. If this test were applied to all the divisions of through rates which the trunk lines now give to railways controlled by industrial corporations, there is no question but that some of these divisions would be materially reduced. Mr. Moore, in the letter which we print elsewhere, is disposed to bewail the fate of the short railway. He thinks he sees indications of a disposition on the part of the big lines to so maltreat the little lines as to force their owners to sell them at a low price. It may be that the trunk lines have been at times somewhat ruthless in their dealings with short lines which were independently owned, but an investigation of their relations with railways, whether short or long, which are owned by industrial concerns having a large amount of traffic to bestow will show that they often have been and still are exceedingly generous in giving allowances and making divisions. There are some short railways owned by great industrial corporations in this country whose gross and net earnings per mile far exceed those of the greatest trunk line railways. Sometimes a small railway needs protection from a big one; but if the small railway happens to be owned by an industrial corporation with a large amount of traffic to give, the big railway is more apt to need protection from the small one!

THE RAILWAY HEADSHIP OF NEW ENGLAND.

THE withdrawal of President Tuttle from the presidency of the Boston & Maine and the accession of President Mellen cannot be called unexpected. It was looked for at the last annual Boston & Maine meeting and was, presumptively, deferred only for outside reasons relating to legislative conditions in Massachusetts, rather than for reasons inside and corporate. However that may be, the headship of the Boston & Maine now passes to President Mellen officially as well as actually. He may and probably must act through a lieutenant. But the directive energy, the outlining of broad policies, and the responsibilities all vest hereafter in the New Haven corporation and its head. The two large systems, which together reach so near to a railway monopoly in New England, are merged and must ere long be welded. The interests of the one must be fully hereafter the interests of the other, only qualified for some years to come by the large minority interest in Boston & Maine stock. And, if the analogy of other railways is followed, not many years are likely to elapse before that minority interest is extinguished.

The horoscope of the headship of New England railways thus fully confirmed is filled with many signs and portents reaching out in directions far out of proportion to New England geography, though not out of ratio to that region, considered in its broader economic phases. As producer and consumer the six New England states are homogeneous. They import and consume raw material; they export a finished product. Such a homogeneity, in theory at least, implies a unity of economic interest and an interest best served by a unity of transportation interests—in other words, a monopoly—assuming of course that the monoply is well and wisely conducted. But while New England is a concentrated region, even in that condition monopoly must be ramified and intricate. It has to protect its coast line and, in martial metaphor, own a navy. It must watch out against international attack via Canada. As a huge terminal for a great series of trunk lines westward it has its peculiar problems bearing on rates, demurrage and kindred matters. Six states, each with its legislature and in variant moods and tenses of anti-corporation sentiment, raise their annual or biennial crop of railway law-making; and a certain degree of state jealousy and undue local prejudice is bound to attach itself to corporate control focussed at one extremity of a string of states rather than at the center. No observer of railway events in New England during the last few years can doubt that had the focal point of control and policy been Boston instead of New Haven most of the acute frictions in Massachusetts would have been avoided.

Such a situation outlines clearly one line of future policy well nigh compulsory. While charter restrictions will for years to come maintain the New Haven as a Connecticut corporation, the operating energies must more and more center at Boston. This will, beyond doubt, insure to that city in a time not very remote the terminal facilities that the municipality craves—electrification of the suburban lines, the new subways between the two great stations and kindred improvements. One may also look confidently to higher development at that city of the New Haven system's coastwise traffic. But beyond such advances at Boston, important as they are, the main progress of the system under the new dispensation is likely to be outside of the city. The shorter railway route to the White mountains and northern New England summer resorts runs west of Boston and without break. There is the Canadian Pacific business pushing for exit and entry at New York City. The old Vanderbilt contract still stands athwart the New Haven's plan, not long ago seriously considered, of New York-Montreal quick service—but, in experience, such old restrictive contracts must give way to public necessity. Then there is the New York, Westchester & Boston project, mighty expensive already without return, but big with promise of suburban business. More remotely, there are the new extensions to give the Ontario & Western additional connection with the metropolis. Add the connecting line with the

Pennsylvania Railroad via Hell Gate and one does not find a lack of big railway propositions outside of Boston to be carried through along with the imperative rehabilitation of the Boston & Maine. In the line of side problems there are the handling and development of 1,300 miles of trolley roads and the Grand Trunk's invasion of Rhode Island—perhaps serious, perhaps to be compromised by concessions.

The railway headship of New England, thus rounded up and complete, has some other features of more than passing interest besides its assumed burdens. It has been carried through in stress and storm and after vigorous resistance lasting through several years; and, if the present public temper continues, it may be one of the last, if not the very last, big railway consolidations of the land—almost certainly one of the last in an old and intensive railway region of the country. The forecasts of a few years ago telling so insistently how "manifest destiny" pointed with unerring finger to the railway dominance in New England of either the Pennsylvania Railroad or the New York Central are heard no longer, nor are they, much less their fulfillment, likely to be heard from again.

THE ILLINOIS MANUFACTURERS' ASSOCIATION'S SEARCH FOR FACTS.

LA VERNE W. NOYES, president of the Illinois Manufacturers' Association, in an interview with the Chicago press on September 17, referring to the editorial in the *Railway Age Gazette* of September 16 regarding this association, said that the only purpose of the "line of inquiry" opened up by the association in the rate advance cases is to "get at the facts." The Illinois Manufacturers' Association looking for facts is a sight for gods and men. It never did such a thing before. It is about as apt to look for facts as a burglar with the spoils of his enterprise still on him is to seek for the police. If the association wants the facts regarding improper relations of the railways with big shippers disclosed, why does it go and ask the commission to ascertain them? Why does it not itself make them public? It has more expert knowledge on that subject than any other large organization of shippers in the United States.

For example, it could go back to the days before President Roosevelt began to enforce the Elkins act and tell how large concerns belonging to it showed a tireless persistency and a wonderful ingenuity in extorting rebates from the railways. It could tell, for instance, how the International Harvester Company, which is one of its leading members, organized as separate corporations two homoeopathic railways which were used to switch its products from its plants in Chicago to the trunk lines; and how it demanded and received from the trunk lines, in the form of divisions of the through rates on its products, over $3,000,000 in rebates through its Illinois Northern road, and over $500,000 through its Chicago, West Pullman & Southern Railway, within a few years. These figures are from sworn testimony. The Illinois Manufacturers' Association, in the statement it filed with the Interstate Commerce Commission in the rate advance hearings at New York, referred to the alleged fact that grafting to the extent of $1,500,000 had taken place in connection with the repair of cars for the Illinois Central. The Illinois Central, however, has succeeded in getting some of this money back, and civil suits are pending for the recovery of more of it. Did anyone ever hear of the railways getting back that $3,500,000 from the International Harvester Company or any part of it? If the International Harvester Company is so sincerely repentant over the past course of the railways in giving it rebates, why does it not step up to the "captain's desk" and return the money?

After having told of the way these big concerns got rebates up to five or six years ago, the Illinois Manufacturers' Association might, if it is so anxious to have the facts disclosed, tell how, as soon as rebating went out of fashion, it and its members individually began a campaign to recover the unfair advantages of which they had been deprived. Immediately after the Hepburn act went into effect Charles H. Deere, then president of the association, announced in a newspaper interview in Chicago that the association believed that freight rates as a whole in the United States were too high, and proposed to begin a general campaign for their reduction. The impression sought to be conveyed was that the association was going to wage this war in the interest of the public. The extent to which the members of the assocation had previously extorted rebates indicates how virtuous its intentions really were. The association has been merrily waging its campaign for lower rates ever since. Its individual members have constantly put pressure on the railways to get, by published tariffs, the same favors which they used to get in the form of rebates. Some of them have had grievous increases in loss of and damage to freight, if the increases in the amounts of the claims that they have presented to the railways and insisted on having paid is any criterion. Apparently they go on the theory that a rebate by the name of a loss and damage settlement or by any other name smells equally sweet. Others have sought to get their unjust favors given the odor of legality by formal publication in the tariffs. The usual course is for the ABC manufacturing company to go to the DEF railway and offer to give the railway a larger amount of its traffic in consideration of a cut in the rate or the granting, perhaps, of some outrageous transit privilege. The shipper goes on shopping among the competing railways until at last he finds one that will yield to his solicitations. Then all competing roads are told that they must do likewise or lose all the concern's traffic. After an unjust discrimination once has been granted, each traffic manager fears, of course, to start a movement to withdraw it, because he knows such action will lead to his immediate punishment by the withdrawal of traffic from his road.

The railways recently have been trying, by raising rates that are too low, by withdrawing unfair tap line allowances, and by other means, to abolish some of the unfair discriminations which have been brought about in this way, and their efforts to make the big concerns and the big industrial communities pay as high rates in proportion as the little shippers and the small communities is the chief thing that has animated such organizations as the Illinois Manufacturers' Association to such wonderful activity in defense of the "public's" rights. Their zeal in trying, in the interest of the public, to keep down freight rates, is quite moving, in view of the heavy increases that they have made in the prices that they themselves charge the public.

In further pursuance of its desire to have the truth disclosed, the Illinois Manufacturers' Association might tell how it has issued various bulletins containing all manner of malicious misstatements regarding railway affairs. The public has no doubt wondered why railway officers have usually not answered these statements of the association. The association might enlighten the public on that point by telling it that the reason has been that each railway officer has known that if he sought to reply to them he would be punished by the issuance of a bulletin particularly attacking his road and by a reduction in the traffic that members of the association gave to it.

When the Illinois Manufacturers' Association, if it exercised a real zeal for truth, got through telling the facts in its possession about railway affairs, the public would know a great deal more about some phases of those affairs than it has ever known before. It would have some idea of the extent to which bribery and bullying in the form of the bestowal and withdrawal of traffic have been used by big shippers in getting and holding unfair railway concessions, and of the extent to which these shippers, and especially those belonging to the Illinois Manufacturers' Association, have resorted to all manner of sensational misrepresentation about railway rates in general, in order to divert public attention from the unfair discriminations that they were getting, and would have a clearer appreciation of the fact that the big shippers are no more carrying on their present campaign against the railways in the interest of the public than they formerly carried on their campaigns for secret rebates in the interest of the public. It would awaken to the fact that the

course that numerous big industrial corporations take to get low rates from the railways is exactly similar to the course that they take to get a high protective tariff from the government, and that their action in the one case is dictated by the desire to get from the railways unfairly discriminatory rates just as in the other case it often is dictated by a desire to get from the consumer excessive prices.

THE COMMISSION'S IMPOSSIBLE TASK

THOSE people who believe that railway transportation can safely and fairly be regulated strictly by statute are now looking to the Interstate Commerce Commission to set forth the legal basis for solving the problem, never solved hitherto, or what shall be the just prices for carrying several thousand commodities from and to some hundreds of places, by a large number of carriers of very different capabilities. The eight days' hearings which have been held by the commission in New York City must have afforded the public some decidedly useful information; but the public does not know it, and is simply bewildered. This is inevitable, for the investigation of so large and confusing a subject as the making of freight rates for 200,000 miles of railway—or 10,000 miles, for that matter—must necessarily begin with an avalanche of facts, and time must be allowed for citizens to digest these facts for themselves. The information that has come from these hearings is almost wholly negative. It has shown people what a lot of things about rate making cannot be known, and has given some inkling of how large a proportion of the evils that are known, and that shippers complain of, are incurable, except by the creation of other evils. This is useful progress.

Railway men have always claimed that the business of rate making was so far from being an exact science that the only rational course was to entrust the duty to enterprising, honest, public-spirited and responsible men and then let them disregard science and resort to compromise, whenever, in their judgment, that course should seem to produce the least violation of equity. (The first and the fourth of those adjectives are all-important, and must be taken together; for the public commissioner who lacks the incentive of responsibility to the railway enterprise, which must get its living out of the business, is as likely to be a bad rate-maker as is the railway officer who realizes his responsibility to the owners of his road, but who lacks public spirit.) But the shippers' organizations do not accept the railway position, and they have engaged some smart lawyers and seem to be determined to bring out in the public hearings all possible facts which ought to have a bearing on the question, What is a reasonable rate?—and the commission must, of course, let them carry out their purpose. The commissioners know, of course, that these bewildering facts, covering a period of ten to twenty years and relating to a dozen or more roads, will be less useful in forming an opinion on a tariff—a single tariff for all those roads—than would be a single day's study of facts which are not so exact and voluminous, but which are already within their own knowledge. Possibly they may know, also, that these so-called shippers' attorneys are themselves well aware of the impossibility of treating this subject scientifically, and are only trying to kill time and help to delay a decision. That purpose has been charged or suggested in the newspapers. It has also been pointed out that these strenuous arguments against advances in freight rates well be found, in many cases, perhaps most, to be based on the real or supposed interest of a few merchants and manufacturers, although ostensibly they are in the interest of the whole public. The interest of the public is by no means identical with the interest of the shippers. But, whatever may be the weight of these considerations, the facts must be heard and the shippers must "be shown" all that they went to know, no matter how long a time it may take.

The only evidence produced that has been of appreciable value is that concerning the advance in wages and the expected increase in income. The statements of increases in wages are being criticised as inaccurate or misleading, and much time will be spent, no doubt, in correcting them so that a true comparison can be made with the conditions of two or four years ago; but the comparison, when made, will be no more useful than the rough comparisons which have already been made; while the railways have to contend with the concrete fact that they are paying $100 a month to men who could not earn $75 in any other pursuit; and this simply because the labor unions have the friendship of President, Congressmen and newspapers.

The estimates of the probable increase of income if the freight rates are advanced have as little real value as have the details of payrolls, for they are exceedingly rough estimates at best; and, even assuming them to be illuminating, they can fairly be used only as side lights. The main justification for the proposed advances in these long distance freight rates is that they are far too low as compared with those for more moderate distances. This was brought out by some of the traffic officers who testified on the last day of the hearing. It ought to have been brought out earlier. This is only one example of the unsystematic way in which the railways' case was presented. Some of the New York papers have been severe in their condemnation of the railways' blundering, and there certainly has been a great deal of misdirected energy; but the correction of the blunders will not cure the difficulties, for almost the only value of the additional facts which may be brought out by the shippers' cross-questioning will be to give to the "average citizen" the enlightenment on the general subject to which we have referred. The principal basis of the commissioners' decision must be mainly that knowledge of the whole subject which they have acquired by their experience of the past ten years. The facts which they gather in their investigation of the immediate situation will be useful more as markers or guide posts than as data which can be dealt with mathematically. The most useful information that they will gather will not be the cold facts of the statisticians, but the less wordy but more vital facts, mixed with a good deal of opinion, such as have been presented by Vice-President Thayer, of the Pennsylvania Railroad, and as are expected from President Willard, of the Baltimore & Ohio. President Ripley, of the Atchison, gave some of this kind of information at Chicago. To the lawyers it may seem shockingly irregular to give a mere "witness" more credit for his opinions than for his facts; but the whole business of rate-making is full of irregularities! If the regular and formal methods of the lawyers had the power of reforming rate-making it would have been done long ago!

Paying dividends in past years on watered stock was touched on in the New York hearings, and has been brought up at Chicago this week. The commission will have to take cognizance of these statements and claims, for many railway stock issues have concealed from a large part of the general public extensive schemes for exorbitant dividends, which the public is determined to punish as crimes if it can find a way; but practically there can be no benefit in this line of investigation, for the sins of the past cannot be suitably punished by limiting freight rates in the present. "Guilt is personal," and an unfaithful public servant must be dealt with while he is alive and get-at-able. Besides, how can the commission measure the relative magnitude of the offenses of different roads?

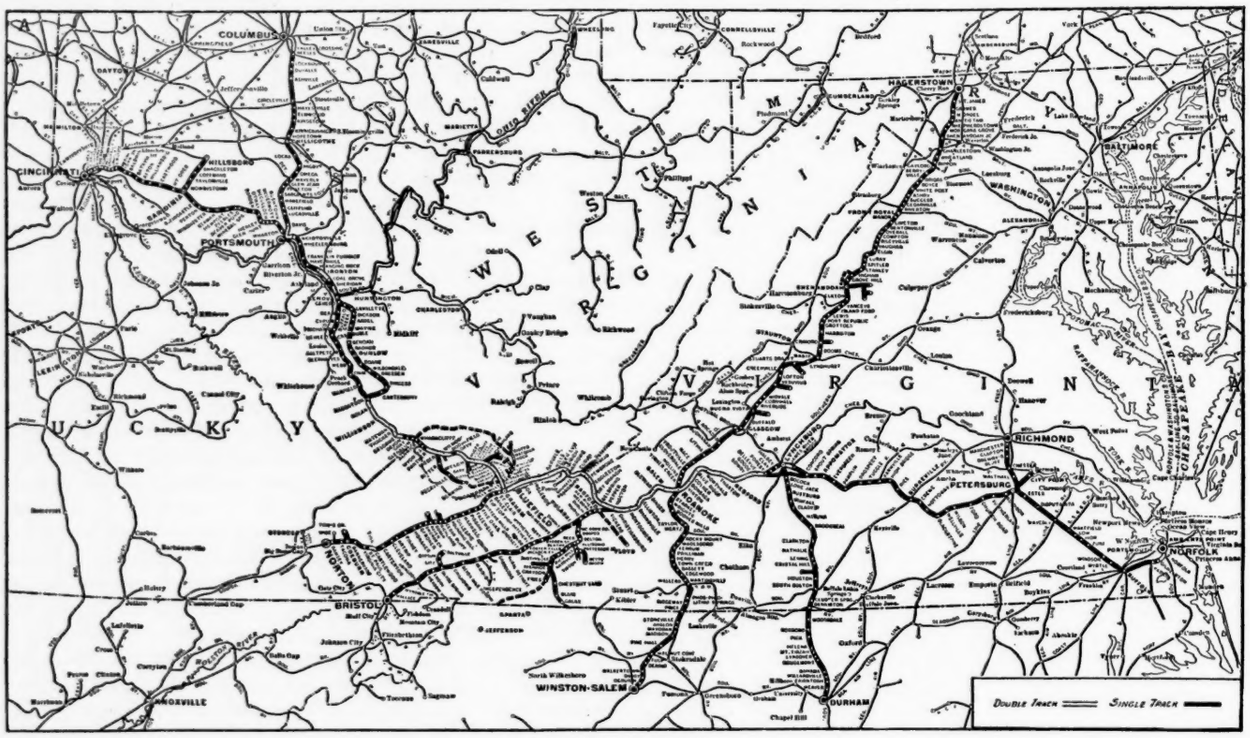
The reasons for raising rates are simple, and are plain to all: (1) the disparity between hundred-mile rates and thousand-mile rates; (2) the unprofitable nature of most of the passenger business (the public insists on low fares and therefore should make up the difference to the railways on freight carriage); (3) the increase in the "cost of living" for which the railways have had little or no recompense. There is a fourth important reason, the need of better stations and the abolition of grade crossings. The adjustment of this problem, for which the public and the railways are almost equally responsible, seems to be very difficult; but it cannot be ignored. The one (and only) possible reason for not raising rates is that the increase in the volume of traffic may sufficiently improve the profits of the railways and thus make unnecessary any increase in rates. Why don't the shippers try to prove that this will be the case?

NORFOLK & WESTERN.

THE opening of the United States Steel Corporation's new plant at Gary, Ind., has had a marked effect on the coal business of the roads operating both east and west of the West Virginia coal fields. This is well illustrated by the report of the Norfolk & Western Railway Co. for the fiscal year ended June 30, 1910. In 1909 the mileage of loaded freight cars north and eastbound totaled 98,750,697 miles, and south and westbound totaled 98,128,217 miles. In 1910 the loaded mileage north and east increased by 12 per cent., totaling 110,918,298 miles, while the loaded mileage south and west increased 21 per cent., totaling 119,055,094. The Norfolk & Western has been preparing for this increase in westbound tonnage, which is probably in good part bituminous coal, by heavy expeditures in the past few years on double tracking its line from the West Virginia coal fields west. Since June 30, 1907, the company has spent $15,978,993 on road, of which $8,542,118 was spent in 1910. Of the amount spent in 1910, $2,742,364 was spent for additional main tracks. When the second track, now under construction, is finished, about January, 1911, the Norfolk & Western will have a double track from the West Virginia coal fields to Columbus, Ohio, with the exception of about 4½ miles of single track and gauntlet track in West Virginia. Nearly all of the coal that moves west on the Norfolk & Western originates west of Bluefields, and therefore has a grade in its favor almost the entire distance to Columbus. At Columbus this coal traffic in its entirety is turned over to the Pennsylvania Lines.

The economies effected by the improvements that have already been made, and especially by the double track work that has been completed, may be approximately estimated by a comparison of the train mileage statistics and the increase in net earnings from operation. In 1910 the Norfolk & Western earned, gross, $35,000,000, of which $30,000,000 was from freight revenue. This is an increase of 19 per cent. in gross revenue and an increase of 22 per cent. in the revenue from freight. Operating expenses amounted last year to $21,000,000, as against $17,700,000 the year before. This is an increase of 18 per cent., and the company figures that the increase in cost of handling freight was 19 per cent. The increase in net operating revenue from freight was 25 per cent., as against the increase of 22 per cent. in gross revenue from freight. Revenue freight train mileage totaled 10,401,187 miles last year, an increase of 22 per cent. It will be seen, therefore, that freight train mileage increased just about in proportion to the increase in gross freight revenue, although not quite in proportion to the increase in tons carried one mile, since in 1910 the ton mileage totaled 6,722,495,887 miles, which is an increase of 25 per cent. over 1909. A lower train mileage cost, therefore, accounts for the saving in net earnings, and this lower train mileage cost is presumably quite largely due to improvements in track facilities.

It is also, perhaps, partially due to liberal expenditures that have been made for new rolling stock and motive power. In 1910 the company bought 26 locomotives and 3,919 freight train cars. Maintenance of equipment as a whole cost $5,951,907 in 1910, comparing with $4,919,435 in 1909. The following table shows the unit costs of maintenance:



Norfolk & Western.

All of the double track that is now in operation is not shown on this map because the company's new map has not been received yet.

	1910.	1909.
*Maintenance of way, per mile	$1,346	$1,242
†Repairs, per locomotive	1,808	1,300
" " passenger car	684	523
" " freight car	58	53

*Per mile of first, second, third, etc., track, the cost of two miles of siding and switch tracks being taken as equal to the cost of maintenance of one mile of main track.

†This is for repairs only and does not include renewals, depreciation or superintendence charges.

These expenditures are liberal, and when it is remembered that the company has spent, in addition to these sums for maintenance, $2,573,598 out of income for improvement and betterment to the property, it is evident that the management is pursuing a policy of keeping its property in shape to meet more exacting requirements of operation, while at the same time it issues new securities only in accordance with conservative principles in regard to the upkeep.

Conducting transportation cost $10,069,726 last year, comparing with $8,346,992 the year before. The increases in various accounts going to make up transportation expenses are largely in those accounts in which the cost of wages is the predominating factor, while such items as fuel for road locomotives do not show proportionately increased cost.

Of the total tonnage carried by the Norfolk & Western

amounting in 1910 to 25,412,529 tons, bituminous coal furnished 13,986,045 tons. This tonnage of coal is greater by 3,029,293 tons than in 1909. The products of steel mills and iron furnaces show increases about in proportion to that in bituminous coal, and this would apparently indicate that the Steel Corporation's plant at Gary not only benefits the Norfolk & Western by furnishing a market for its coal, but also furnishes a considerable tonnage of iron and steel products which move east.

The Norfolk & Western is in a strong position financially to carry out its program of betterment and improvement. During the year the company sold $1,530,800 common stock held in its treasury since 1897, and it also offered to stockholders at par $10,993,000 convertible 10-25 year 4 per cent. bonds authorized in 1906. The unissued remainder of these bonds is $8,431,000. During the year $2,754,000 notes, due May 1, 1910, were bought before maturity, and the remaining $3,632,000 notes were paid at maturity. On June 30 the company had on hand $9,198,550 cash. This is $5,642,708 more cash than the company had in its treasury at the close of the previous fiscal year. Total working assets amounted in 1910 to $23,271,115, and working liabilities amounted to $4,941,094.

The balance sheet is drawn up in accordance with the form prescribed by the Interstate Commerce Commission, but as Henry Fink, chairman of the board, remarked in commenting on the various statements in the report in which the directors say that while they were compelled to follow the orders of the commission it was against their business judgment to do so, "they have taken the liberty, in making a report to the stockholders of the company, of stating things as they are, as well as carrying out accounting theory." Since the reorganized company took over the operation of the road, October 1, 1896, there has been spent for new lines, branches and extensions, side tracks, yards, equipment, grade revision and changes of line, and for advances to subsidiary companies for construction purposes, $76,861,770, of which sum $53,519,422 was obtained from the sale of securities, and the remainder, $23,342,448, was spent from income. The management, believing that the future requirements for additions and improvements will necessitate expenditures considerably in excess of the $8,431,000 convertible bonds authorized in 1906 and as yet unissued, is to ask the stockholders at the October meeting to authorize an increase in the common stock from $100,000,000 to $150,000,000, providing that either stock or convertible bonds may be issued according to conditions in the bond and stock market.

The Norfolk & Western passenger station at Norfolk was completely destroyed by fire October 13, 1909, and since then the company has been using temporary quarters. Negotiations have been carried on with the Virginian Railway and the Norfolk Southern, and a plan has been made for building a joint passenger terminal for these three companies at Norfolk through the organization of a Norfolk Terminal Railway Company, whose securities are to be guaranteed by the three railway companies. The new passenger terminal will be near the site of the former Norfolk & Western station, and a seven-story office building and passenger station will be built at an estimated cost of about $750,000, to be completed during 1911.

The following table shows the results of operation in 1910 compared with 1909:

	1910.	1909.
Average miles operated	1,945	1,925
Freight revenue	$30,037,796	$24,710,591
Passenger revenue	3,924,890	3,642,837
Total operating revenue	35,063,870	29,327,102
Maintenance of way	3,752,045	3,331,888
Maintenance of equipment	5,951,907	4,919,435
Traffic	551,806	487,106
Transportation	10,069,726	8,346,992
Total operating expenses	21,046,760	17,729,756
Taxes	1,118,965	1,008,800
Net operating income	12,898,155	10,588,546
Gross corporate income	14,044,362	11,569,658
Net corporate income	9,043,165	6,665,433
Additions and betterments	3,573,598	1,730,580
*Dividends	4,352,511	3,648,436
Surplus	1,117,056	1,286,417

*Including $138,000 in 1910, and $150,000 in 1909, payment on account of deficiency of sinking fund and interest on Norfolk & Western-Pocahontas joint bonds.

WHEELING & LAKE ERIE.

"WHILE traffic density for the main line and branches of the Wheeling & Lake Erie is shown as 2,521,364 tons, it will be interesting to note that the traffic density, as representing the number of tons moved one mile per mile of road, in 1910 on the main line between Huron and Pittsburgh Junction averaged 5,196,340 tons, and between Brewster and Pittsburgh Junction the average was 5,617,699 tons. For the month of July, 1910, the traffic density between Brewster and Pittsburgh Junction was at the rate of 6,368,232 tons one mile per mile of road per annum, and the indications are that August will somewhat exceed this figure, which is probably the greatest traffic density of any single track railway in operation." Receiver Worthington makes this statement in commenting on the showing made by the Wheeling & Lake Erie for the fiscal year ended June 30, 1910, and it gives much information in regard to the general characteristics of the Wheeling. The road runs from Toledo, the lake terminus of the Wabash, to Pittsburgh Junction, where it connects with the Wabash-Pittsburgh Terminal, which gives the Gould roads their entrance into Pittsburgh. As is pointed out in the statement quoted, the road is single track.

The property was put into the hands of the receiver in June, 1907, on account of claims due the National Car Wheel Company totaling something over $8,000,000. At the time of the receivership proceedings the company had a joint agreement with the Wabash to make up any deficiency on Wabash-Pittsburgh Terminal interest payment by the appropriation of 25 per cent. of the earnings from traffic exchanged with the Terminal company. With the permission of the court, the receiver abrogated this agreement, and shortly afterwards the Wabash also refused to recognize the agreement. At first it was proposed to reorganize the Wheeling & Lake Erie and the Wabash-Pittsburgh Terminal as one property, but in May, 1910, the committee who had charge of the reorganization, issued a statement in which they said that because of legal difficulties they found it unsatisfactory to try to link the two companies together in a reorganization plan, and they had decided to confine their efforts to a reorganization of the Wheeling & Lake Erie as a separate property.

The road is a good earner. In 1910, with an operated main line mileage of 522 miles, the property earned gross $6,950,000, or at the rate of $13,315 per mile. This gross revenue last year compares with $5,600,000 earned the year before. Operating expenses amounted last year to $4,800,000 and to $4,200,000 the year before. There is shown, therefore, an increase of 23 per cent. in gross earnings, with an increase of but 14 per cent. in operating expenses.

At the time that the receiver took charge of the property he apparently found it in bad shape. He had, however, this advantage, that the territory through which the road operates has so great traffic possibilities that it was largely a question of providing facilities to handle this traffic to make possible a material increase in gross earnings. The receiver has issued $4,002,340 receiver's certificates, of the proceeds of which $3,661,000 has been, or is to be, spent for rehabilitation of the property and $341,350 has been spent for payment of interest on bonds and for property taxes. An analysis of the receiver's balance sheet of 1910 shows that in addition to the payments from the proceeds of receiver's certificates, there has been $184,171 spent from income for additions and betterments to the road, and $512,967 spent from income for additions and betterments to equipment. The sum shown as spent from the proceeds of receiver's certificates includes something over $200,000 spent in 1909 for what would under ordinary circumstances be charged to maintenance of way.

Details of operating expenses show that in 1910 maintenance of way cost $770,000, as against $620,000 in 1909; maintenance of equipment cost $1,400,000, as against almost the same amount in 1909, while transportation expenses cost $2,400,000 in 1910 and $1,900,000 in 1909. This is a disproportionately heavy in-

crease in transportation expenses as compared with maintenance expenses. This increase in transportation expenses is largely due to increase in wages. For instance, station employees receive 20 per cent. more; yard conductors and brakemen, 24 per cent. more; yard enginemen, 27 per cent. more; road enginemen, 22 per cent. more; road trainmen, 25 per cent. more. This does not mean that the wages of individuals were increased by these per cents., but that the total sums paid in wages to the classes of employees increased this much.

The unit costs of maintenance are given in the following table:

	1910.	1909.
*Maintenance of way, per mile	$1,114	$1,255
†Repairs, per locomotive	2,771	3,176
" " passenger car	681	835
" " freight car	44	61

*Per mile of first, second, third, etc., track, the cost of two miles of siding and switch tracks being taken as equal to the cost of maintenance of one mile of main track.

†This is for repairs only and does not include renewals, depreciation or superintendence charges.

Note.—The maintenance of way in 1909 includes the sums spent from the proceeds of sale of receiver's certificates.

Mr. Worthington figures that if the Wheeling & Lake Erie had had proper facilities for repairing its locomotives, 14 locomotives which were repaired at outside shops at a cost of $95,452, or an average of $6,818 per locomotive, could have been repaired by the company itself at an average of $3,537, effecting a total saving of $45,934. The main shop building of the Brewster shops has been finished during the year, and the shops are now in operation and are taking care of all locomotives.

Passenger revenue on the Wheeling & Lake Erie is of comparatively slight importance, the total passenger earnings in 1910 being but $570,000, while total freight revenue amounted to $5,900,000, which is an increase of 23 per cent. over freight revenue in 1909. The total number of tons of revenue freight carried one mile amounted to 1,100,000,000, an increase of a little less than 24 per cent. over the ton miles of 1909. The average haul per ton was 110 miles in 1910 and 107 miles in 1909. To handle 24 per cent. greater revenue ton mileage, there was required a freight train mileage amounting to 1,800,000 miles, an increase of but 19 per cent. from 1909. The unbalanced traffic was about 40 per cent. of the total in both 1909 and 1910, but the average train load increased from 620 tons in 1909 to 640 tons in 1910. The average revenue per ton mile was 5.4 mills in 1909 and 5.39 mills in 1910.

Since 1907 the Wheeling & Lake Erie has shown a gain in amount of tonnage of manufactures handled larger proportionately than the gain in tonnage of any other class of commodities. In 1907 18.77 per cent. of the total tonnage was manufactures; in 1908 it was 18.45 per cent. of the total; in 1909, 21.49 per cent., and in 1910, 23.87 per cent. Products of mines in 1907 was 70.36 per cent. of the total tonnage, and in 1910, 67.58 per cent. Bituminous coal furnished 4,398,558 tons in 1910.

It will be seen from these traffic statistics and from the large increases in gross revenue within the past few years that the question of operating the road at a profit after the company has been reorganized depends largely on the conservatism which the reorganization committee may find it feasible to exercise in a recapitalization of the property. The annual report contains a balance sheet of the old company as of June 30, 1910, and also a receiver's balance sheet. Taken together, these two statements show that at present the company is capitalized at somewhere in the neighborhood of $78,000,000, including stock, bonds, equipment obligations and receiver's certificates. If the road were to earn 5 per cent. on this capitalization, it would have to show net operating revenues of about $4,000,000, while net operating revenues in 1910, the best in the history of the company, only amounted to $2,200,000. If we disregard entirely the common and preferred stock of the old company, the road at present has outstanding bonds and stocks and receiver's certificates amounting to about $41,000,000, the interest charges on which at 5 per cent. would be about $2,000,000. This top-heavy capitalization of the old company was brought about partly because the reorganization of the Wheeling & Lake Erie Railway, the predecessor company, in 1899 was not, apparently, drastic enough in scaling down capitalization, and partly because the Wheeling's credit was extensively used in the Gould attempt to form an ocean-to-ocean line. It would seem, therefore, that even with the comparatively good showing made by the road last year, it will be necessary, in a reorganization of the finances of the company, either to make heavy reductions in the nominal capitalization, or else to issue a considerable quantity of securities on which holders cannot expect to receive any substantial return for a number of years to come. The following table gives the principal figures of operation in 1909 and 1910:

	1910.	1909.
Average mileage operated	498	522
Freight revenue	$5,928,570	$4,804,322
Passenger revenue.†	698,115	624,895
Total operating revenue	6,950,437	5,633,645
Maintenance of way	766,714	617,957
Maintenance of equipment	1,389,685	1,380,978
Traffic	85,648	74,231
Transportation	2,366,947	1,947,807
Total operating expenses	4,776,054	4,200,718
Taxes	261,504	260,336
Operating income	1,912,878	1,172,591
Gross corporate income	1,945,175	1,146,906
*Net corporate income	537,450	27,432

*After the deduction of such mortgage obligations as the receiver has been ordered to pay by the court, and the deduction of interest on receiver's certificates and principal and interest on equipment obligations that the receiver has assumed.

†Includes mail and express.

CENTRAL OF GEORGIA.

THE new form of balance sheet prescribed by the Interstate Commerce Commission has compelled a statement which shows a considerable increase in the value of property investment of the Central of Georgia during the years 1908, 1909 and 1910. During these years the Central of Georgia has not paid any interest on its third income mortgage bonds, and it did not pay in 1908 or 1909 any interest on the first and second preference income bonds. The contention of the management of the Central of Georgia has been that the agreement with the holders of income bonds provides that net earnings shall be arrived at after the payment from income of such sums as the management thinks it proper to spend on the betterment and upkeep of the property. The rules prescribed by the Interstate Commerce Commission are that all sums spent for additions and betterments, whether charged to income account or to capital account, shall be shown on the balance sheet on the asset side as improvements to property since 1907, and on the liability side as appropriated surplus.

In the fiscal year ended June 30, 1910, the Central of Georgia earned total operating revenue amounting to $12,100,000, comparing with $11,200,000 in 1909. Operating expenses amounted to $8,500,000 last year and $7,900,000 the year before, leaving, after the payment of taxes, $3,100,000 operating income in 1910 and $2,900,000 in 1909. The company's income account is arranged to show no net income in either 1909 or 1910. The balance, which, after the payment of interest and expenditures for renewals and betterments, amounted in 1910 to only a little over $1,000, and in 1909 to something less than $3,000, was in each year credited to profit and loss. The income account, however, shows that the company spent $1,247,678 in 1910 and $677,567 in 1909 from income for additions and betterments.

The Central of Georgia presents a case in which the accounting theories of the Interstate Commerce Commission squarely meet and oppose the business judgment of the management of a railway. If the sums spent last year and in previous years for additions and betterments are not properly expenses necessary to keep the property in good condition, but are, as the form of the I. C. C. balance sheet presupposes, actually purchase of new property, then the income bondholders, who are at present suing the company to compel payment on their securities, have at least a prima facie case against the management. On the other hand, if these expenditures, while not happening to fit exactly into the square holes arbitrarily called operating ex-

penses by the I. C. C., are nevertheless expenditures that good business judgment says should be made on the property in order to conserve its earning power, then the case of the income bondholders appears without merit.

The Central of Georgia is the Atlantic seaboard connection of the Harriman lines. It has a line to Birmingham, Ala., where it makes physical connection with the Birmingham extension of the Illinois Central. Local business, however, is probably of considerably more importance to the Central of Georgia than is its through traffic exchanged with the Illinois Central. The map of the Central of Georgia shows a typical Southern railway; a network connecting points comparatively close together, important commercial cities—Savannah, Macon, Atlanta, Chattanooga, Birmingham and Montgomery—and with a large mileage of branch lines spreading out from these main lines. Thus the traffic is not concentrated on one main line and moved east and west or north and south, as the case may be, but is gathered by the feeders, moves to a distributing center, from where it is sent out to nearby local points.

Of the total freight tonnage, which amounted in 1910 to 4,973,801 tons, 20.74 per cent. was furnished by products of agriculture, 1.28 per cent. by products of animals, 22.61 per cent. by products of mines, 17.81 per cent. by products of forests and 37.56 per cent. by products of manufactures and miscellaneous articles.

The Central of Georgia is essentially a farmers and planters' railway. Besides the 1,031,540 tons of products of agriculture carried in 1910, 691,151 tons of fertilizer were carried and classified as manufactures and miscellaneous. If we add the tonnage of fertilizer to the tonnage of products of agriculture, it will be seen that nearly 35 per cent. of the total tonnage last year consisted of either products of the farm or raw material used in raising these products.

The ton miles of revenue freight last year totaled 744,546,658, an increase of 8 per cent. over the ton miles of 1909. The average revenue per ton per mile last year was 1.069 cents and 1.079 cents the year before. This high ton mile rate shows the small proportion of low grade tonnage carried by the road. The comparatively light average train load, which was 255 tons in 1910 and 257 tons in 1909, also reflects the character of the tonnage, and is also a result of large proportion of branch mileage.

Operating expenses as a whole amounted to $8,500,000 last year, an increase of 7.80 per cent. over operating expenses in 1909. This increase was about equally divided in total amount between maintenance of way and transportation expenses. Maintenance of way cost $1,900,000 in 1910, 21.85 per cent. more than in 1909, and transportation expenses cost $3,700,000, or 7.36 per cent. more than in 1909.

The following table shows the principal figures for operation in 1910 and 1909, rearranged to conform to our usual method of stating results of operation:

	1910.	1909.
Average mileage operated	1,916	1,916
Freight revenue	$7,961,474	$7,430,497
*Passenger revenue	3,025,847	2,744,115
Total operating revenue	12,052,756	11,155,182
Maintenance of way	1,882,225	1,544,714
Maintenance of equipment	2,036,096	2,119,689
Traffic	377,013	321,621
Transportation	3,684,769	3,432,075
Total operating expenses	8,474,910	7,862,036
Taxes	540,619	487,827
Operating income	3,106,998	2,866,867
Gross corporate income	3,839,989	3,587,523
Net corporate income	1,319,339	1,053,365
Renewals, betterments and reserve	1,318,123	837,101
Surplus	1,216	216,164

*Not including mail, express, etc.

NEW BOOKS.

Proceedings of the International Railway Fuel Association. 193 pages; 6 in. x 9 in. Price, morocco, 75 cents; paper, 35 cents. Published annually by D. B. Sebastian, Secretary, La Salle Street Station, Chicago.

The proceedings of the second annual convention of the International Railway Fuel Association, held at Chicago, May 23-26, 1910, have been issued by the secretary. The volume contains the stenographic report of the meetings, papers delivered and the discussions. The constitution and by-laws and a list of members of the association are also given.

Letters to the Editor.

THE CASE FOR THE SMALLER RAILWAYS.

St. Louis, Sept. 12, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Great concentration of power has of late years placed many of the transportation facilities within the control of a few interests, but the overflow of lesser undertakings cannot be altogether absorbed and assimilated. It is unfortunate that there seems to be a tendency on the part of some of the greater interests to antagonize and retard these lesser arteries of commerce, and for the moment it would seem that antagonism exists which might possibly result in some serious antagonistic alinement of interests that should work in complete harmony.

The question of a national organization of lesser lines, including all transportation properties that are not under the blanket protection of the American Railway Association, need not be taken as a movement that would antagonize anything that is right in the older and more powerful organization. The lesser lines, through their organization, could centralize their efforts to let the people know what they they were doing and what they were trying to accomplish. They might, through publicity and fairness, convince all interested parties that they had some rights as small investors of capital—rights that should be protected under our constitution because they are rights.

The people of the United States will eventually be able to discriminate between the true and the fictitious transportation companies. Length of track alone will not furnish a proper solution. The service rendered is the unit of just comparison. The development made and services rendered are the objects of transportation life. I cannot believe that the master minds devoted to the solution of these problems will fail to hit on some plan that will enable all interests to work together for the common good.

It does seem advisable that the lesser lines form an association under proper classification, and that through their association and within their chartered rights they should endeavor to protect their operations and to help solve the great problems that are facing us in our immense commercial activities.

It would be unwise and revolutionary to set one great interest against another, to inflame the passions of the people against the larger corporations and to excite undue sympathy for the under dog. The people will not be interested in the affairs of corporations unless they see that by exercising an intelligent interest they can secure for themselves a certain benefit.

The population of our country has formed itself into two separate associations for political purposes, but there should be only one association when it comes to the question of industrial peace, harmony and progress.

The organization of the American Railway Association, which for many years has been under the very able management of W. F. Allen as its secretary, has accomplished great and lasting good, not only for the transportation companies subscribing to its constitution and by-laws, but to the general public as well. It has enabled roads to join together in harmonious action, and has afforded its members a protection that has given them a sense of security and has made them feel as though they could develop their properties with a reasonable assurance that the development would be protected; it furnishes a great central working power influencing in many ways the efficiency of our railway systems. For its good qualities it is to be commended, but there seems to be a great overflow which the American Railway Association does not care to admit to its membership.

Many of these small roads have very materially developed different sections of the country, which the larger lines, through their amicable associations, have refrained from developing for fear of creating strife among themselves. Many of these lesser lines are anxious to further develop the territory through which they operate. To do this they must employ large capital to secure labor and materials, and they are looking to the people of the United States for a just protection for their invested

money, because they invest this money for the people's benefit. Many of these lesser lines are trying, in their humble way, to help solve some of the problems that vex our large industrial interests in the cities, are trying to construct avenues of trade, to penetrate the forests for lumber, the mountains for mineral and coal, the great undeveloped prairies for grain, and to create communities that will add to the ranks of the consumer. Their operations may seem ridiculously small when viewed in connection with the vast undertakings of the more powerful lines, but, be that as it may, they could assist in the development of this country—its wealth and its citizenship—through a national organization created and supported by their many small interests.

They, too, would have a centralizing force, through which, at a minimum expense, a maximum effect could be obtained; they could plan for their future extensions, they could secure proper working arrangements with other lines, they could harmonize discrepancies in rates, they could open new avenues of trade and protect the producing and trade centers served by them.

GEORGE F. MOORE,
President, Manufacturers' Railway of St. Louis.

CONTROL OF THE TESTING DEPARTMENT.

New York, Sept. 12, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In his paper on the testing department, presented at the September meeting of the New York Railroad Club, S. B. Hinckley argued very strongly that it should be removed from the jurisdiction of the mechanical and placed under that of the purchasing department, because, when matters are as they are at present the outside supply house has no protection against favoritism, and because "if the testing department is directly or indirectly under the mechanical department head, or under the chief engineer, it is quite certain that materials, patent devices or mechanical specialties, not appealing to the chiefs of these departments will be found of no value and that reports which in any way reflect on the efficiency or economies of the mechanical or engineering department might be safely consigned to the dusty archives." This is certainly an ingenious if not an ingenuous argument. The one great complaint that the mechanical department has always had against the purchasing department is that it is governed too much by price and favoritism in the purchase of supplies and not enough by merit. That it is apt to look more closely into discount than strict adherence to specifications, and that if it were not for these specifications drawn up by the mechanical department and its insistance that the goods delivered shall be in accordance therewith, discount would be the cock of the walk and the quality of supplies would be consigned to the demnition bowwows. This, to be sure, is a sweeping assertion that may need great qualifications in specific instances, but the state of affairs is quite natural and unavoidable. It is beyond reason to expect a purchasing agent to be familiar with the physical qualities of what he buys. He cannot be expected to appreciate the value, from an endurance standpoint, of the variation in the limit of elasticity of two steels. Why should he? He never uses them and does not even know where they are applied.

The intimation, too, is that the mechanical department is not so apt to be fair as the purchasing. Why? If there are any two departments on a railway that are known by their fruits it is the mechanical and the engineering. If they buy or permit to be bought any materials that do not give a safe and satisfactory service, they hear from it at once, and if they specify materials that raise the cost of operation in the slightest, they are asked to explain. Surely the purchasing department cannot be expected to take the broad view of ultimate economy that has been driven home to the users by years of varying experiences. And why this insinuation that the mechanical department is not to be trusted? Are the skirts of the purchasing department so perfectly free from suspicion and conviction of favoritism and graft that implicit trust is to be put upon it? As a matter of fact the supplyman who is willing to bribe goes to the bribeable man, regardless of the department he represents, provided only that he has a voice in the purchase of supplies. If we could have a confession from men who are widely suspected of doing business in this way, we should probably be astounded at the scope of their operations, and should find all sorts and conditions of men to be included therein.

But this is aside from the question, the jurisdiction of the testing department. It may well be made an independent organization, and it may be urged that it should not be subordinated to any other; but however it may be conducted, this much is certain, that the results of its investigations should be immediately accessible to the users of the materials that it examines, and its operations should, to an extent, be guided by them, because there are such a multiplicity of conditions under which all railway material is used that it is only the man in the field who can say as to exactly what he wants. So if the liability to the influence of favoritism in the making of purchases is the only argument that can be advanced for the transference of the testing department from the mechanical to the purchasing, it had best be left where it is. ENGINEER.

DROP FLANGE TEST.

Pittsburgh, Pa., Sept. 18, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I wish to call the attention of your readers to the remarkable results brought out by The Lobdell Car Wheel Co.'s drop flange test. A hammer is arranged on the same principle as the M. C. B. drop test, to fall directly on the *inside* of the car wheel flange, instead of on the hub of the car wheel, as provided for in the M. C. B. test. The hammer weighs 21 lbs. and falls 12 ft., giving a sledgehammer blow to the inside of the flange. It will be seen that this approximates as nearly as possible the shock the flange receives when it strikes a crossing, or is "whipped" at the end of a train against a curve. The M. C. B. test develops any strain that remains in the car wheel after it leaves the annealing pit, and, in addition, shows the grain of the mixture used in making the wheel, and also the depth of the chill, but it does not show strength of the flange to resist shock.

In making heavy cast-iron guns for the Government years ago, it was thought desirable to run the tensile strength of the metal up to from 30,000 to 33,000 lbs. per square inch, the cold blast charcoal pig iron of which the guns were made only giving from 20,000 to 22,000 lbs. tensile strength in the pig. This was accomplished by remelting the pig iron in an air furnace once, and sometimes twice, before it was put in the casting. The remelting ran up the tensile strength about 5,000 lbs each time. It was found, however, that while the tensile strength was increased, the brittleness was also increased, so that the iron of highest tensile strength was least able to resist the shock of a hammer or the force of the powder in the charge.

Now this is just the difficulty with the present chilled iron mixtures for car wheels. The old wheels when remelted undoubtedly gain in tensile strength, if they are of good quality, but at the same time become brittle and weak under the shock the wheels receive in service, and this is especially true of the flange, the weakest part of the wheel.

The Lobdell drop flange test has shown by repeated experiments that nickel increases the tensile strength of the car wheel mixture, and instead of increasing the brittleness makes the mixture tougher, and the flange is better able to resist the shock to which it is subjected. A wheel that was nickelized, cast from an open hearth surface, stood 36 blows of this hammer test, while a standard chilled wheel broke under 5 blows.

This is really a remarkable discovery and contrary to all the experience of founders in the last fifty years. It opens a new field for investigation, as it is in no sense confined to car wheels, but can be taken advantage of wherever it is desirable to use a strong, tough cast iron, free from brittleness. It is a striking fact that this peculiarity of combining tensile strength and toughness, which is the essential difference between cast and wrought iron or steel, is only true of nickelized castings, and places them in the first rank of cast-iron mixtures. ROBERT C. TOTTEN.

THE TESTING DEPARTMENT.*

BY B. S. HINCKLEY.
Engineer of Tests, New York, New Haven & Hartford.

The testing department is the result of natural development in the modern organization of any well managed railway. The existence of such a department in itself demonstrates that money is saved by supporting it, and when we consider that the greater part of the economy is indirect and invisible, so far as actual accounting will show—it is the more commendable to the shrewd insight of the management in appropriating thousands of dollars each year for its support. Only recently has a testing department been considered of any special value to the large corporations who heretofore have considered such a department one of expense only and one not necessary to secure the greatest possible economy of operation. To-day we rarely find a live railway corporation without its testing department.

Primarily the testing department works hand in hand with the department of purchases. The basis of all the work of an analytical and testing laboratory is the preparation and execution of the specifications for the material under investigation. In this class of work it is of the utmost importance for the purchaser or consumer to bear in mind that nothing should be embodied in the specifications for any material that will tend to increase the cost of that material to an amount over and above a price at which a satisfactory grade can be purchased in the open market and taken from the reserve stocks of the large manufacturers of that material. In other words, while the specification should be made sufficiently rigid to protect the purchaser from substitution of inferior or adulterated material, it should not go to the other extreme and place such restrictions on the method of manufacture that the manufacturer cannot produce the goods without upsetting the ordinary routine of his daily operations, and adopt, or be forced to adopt, methods entirely foreign to his common practice.

There are many manufacturers and contractors by whom the word "specification" is uttered with a feeling of irony—the word leaves a bad taste in their mouths; they consider specifications unnecessary, discriminating, and very frequently unfair. The engineering profession alone is responsible for this feeling, for the reason that so many specifications have been prepared without proper regard for the interests of the manufacturer or contractor and involve only the interests of the purchaser.

The work of the department is as closely related to commercial life as the traffic department or the purchasing department. The men of the testing department become familiar with the qualities and value of raw materials as well as with the manufacture of almost every conceivable product of our mills and factories. It is the desire of the testing department that it be considered as a bureau of consulting engineers and chemists and not a department whose main object is to find fault and offer destructive criticism. Our whole object is to build up—to formulate and have executed specifications that are satisfactory to both the manufacturer and the railway. Without specifications the only protection at hand for the railway is careful inspection and accurate records of the service of material bought on a guarantee basis.

We will admit that many classes of material are bought more economically on a guarantee basis than on specification, but of what use is the guarantee if it is everybody's business (which means nobody's business) to see that the guarantee is fulfilled? Among the supplies that may be more economically purchased on a guarantee basis are rubber goods, paints and possibly bearing metals. In the manufacture of these materials there are perhaps secret tricks of the trade which give to a particular brand its own particularly valuable characteristic, and a chemist may never be able to reveal just what treatment is given outside of mixing together various quantities of the separate ingredients which he is able to discover. The layman is not in a position to dictate to a manufacturer as to how he shall make his product; he may advise him what service he will expect from it, but he is compelled to leave it to the manufacturer to produce the article.

As may be expected of a department just coming to its own—a department considered by short sighted and penurious managements as an unnecessary expense—the size and importance of the testing department on the railways of this country are small compared to what they should be. On a great many roads the man or men in charge of testing materials and equipment are employees of the mechanical department and report either directly or indirectly to the motive power official. This is a great mistake—it is just as absurd as it would be to have the auditor of accounts report to the cashier. The testing department should be independent of all mechanical or engineering departments, for the chief economical results are secured only by giving freedom to the department of tests in its work of checking the quality, handling and use of the materials purchased.

What the testing department should do is to show up the defective material, not only at the factory and mill, but after the material has reached its destination and has been applied to the equipment, road-bed or structures. From a disinterested point of view the testing department should follow up the service of material and apparatus applied to the locomotives and cars, or bridges and buildings, should be free to state plainly wherein one device or another was not economical, although possibly that device might be in the opinion of the motive power man, or the chief engineer, the best for the purpose. The necessary independent and unbiased investigations and reports are impossible from a subordinate to his superior when the subordinate knows that his reports may be embarrassing to the man to whom he reports. If the testing department is directly or indirectly under the mechanical department head or under the chief engineer, it is quite certain that materials, patent devices or mechanical specialties not appealing to the chiefs of these departments will be found of no value to that company, and that reports which in any way reflect on the efficiency or economies of the mechanical department or the engineering department might be safely consigned to the dusty archives and copies not forwarded to the man in charge of purchases.

The need of laboratory and service tests was naturally first felt by the mechanical department, and this class of work was handed over to men acquainted with technical investigations. These men were in many cases college graduates who had chosen railway work for their occupation. Some were special apprentices, others perhaps draftsmen or bright, young machinists' apprentices. They spent a portion of their time doing this test work and finally the whole time of one man was required to handle the work. This man was usually a chemist, for the mechanical test work could be handled by the force of the mechanical engineer or chief draftsman. On many roads to-day, and many of them large systems, this condition still prevails, and anyone taking the time to superficially look over the quality of material received by these roads will be impressed with the necessity for a quick development of the testing work and the proper organization of a testing department.

Even a single employee would produce good results if he was allowed to report to the proper official, but usually, if not always, where the test work is handled by one or a few men, they are subordinate to the mechanical officer and their efficiency practically eliminated thereby. The motive power and engineering departments are the departments using or having jurisdiction over most of the material and supplies purchased by the railway. Why should either of these departments have charge of examining and testing this material? Wherein is there any protection for the supply house which is on the outside, wherein is there any protection for the railway against favoritism, and how can the official in charge of purchases know the true relative merits of the various materials on which he has secured prices? As said before, the testing department should be independent of all operating and engineering departments. The man at the head of the department, the engineer of tests or whatever title he may have, should report to the highest official having any jurisdiction over the purchases. Only in this way and by such organization is the full benefit of a testing department secured.

While, as stated, the testing department should be directly re-

*Abstract of a paper presented at the September meeting of the New York Railroad Club.

sponsible to the highest official having jurisdiction over purchases, it should be the right and privilege of the heads of all departments of the road to request investigations, analyses or tests of any proposition, material or device in which they may be interested or may consider worthy of attention. Reports on these matters should be sent to the department head submitting the proposition and a copy of the report sent to the official to whom the head of the testing department is directly responsible.

The greatest single item of expense for a railway outside of payrolls and equipment is the coal bill. One of the greatest economies that can be instituted is to give practically full jurisdiction of the fuel supply to the testing department. By careful systematic checking of the coal shipments from the mines to its consumption at the firebox door—by correct sampling, analyses and tests, very material economies can be obtained. All of this work can well be handled by the testing department, and it is safe to say the visible saving from this one branch of the work will cover the cost of the maintenance of the testing department many times over.

Frequent statements are made that proper inspection and tests of bridge material cannot be handled economically by the testing department of a railway. These same people will say that it is better to employ the outside bureaus and pay a certain price per ton for the mill and shop inspection. This all depends on the size and importance of the testing department under consideration. It is easily possible to handle this work satisfactorily and economically if the railway can keep men busy in the territory where the bridge material is being fabricated. The same men can cover an area of one or two hundred miles radius and handle the inspection of other classes of material purchased within that area. These men should be resident inspectors in the city where the greater part of their work is located, and they should be reimbursed for all expenses incurred outside of their home city. In rare cases the outside bureaus should be used—this will occur when the tonnage to be inspected is too small to warrant the expenditure of salary and traveling expenses of the railway inspector. In handling the inspection of bridge material in this way the road secures more loyal and interested inspection than can be possible when the outside bureaus are given a blanket contract to handle the entire inspection of the bridge material. Naturally each road must decide on this matter as best suits its conditions and organization.

The inspection of new equipment—locomotives, cars, both passenger and freight, at the builder's shops, is another line of work that may very profitably be left to the testing department. This method of handling the work is not common, but where it has been tried, it has proven quite satisfactory. Owing to the fact that this work may at one time be rushed and at another dropped altogether, it is of no advantage to have men retained on the payroll of the testing department to handle this work alone. Practical men taken direct from the shops are best fitted for the work as they are acquainted with the standard practice of the company. On this account men should be selected from the shop forces and temporarily turned over to the testing department so far as reports are concerned. It is not necessary to remove them from the payroll of the mechanical department. This arrangement is quite necessary on account of the close connection of the material inspection with the use of the material in the construction of the equipment. Furthermore, the highest official in charge of the purchases is kept in close touch with the character of work and materials furnished by the builder.

Where a railway produces on its line of road a substantial percentage of its tie supply the testing department, which naturally handles the inspection of the ties and timber, can very handily have charge of the collection and distribution of the ties. The specifications for cross ties should be so drawn that it is made clear to the tie producer, that by the actual inspection of the tie the purchase of the accepted tie is completed by the railway. This is quite necessary to protect the road from dissatisfied tie producers who otherwise might say they would not accept the inspection of the road and haul away the ties which the company had accepted, and this would mean a loss of the inspectors' time as well as that of the men used in handling the ties.

So closely is the inspection and purchase of ties related that it becomes naturally the work of the testing department to handle entirely the cross tie supply. The inspectors are advised daily to whom the ties should be consigned and in the office of the engineer of tests are the complete records of purchase, inspection, shipment and disposition of all the cross ties as well as native timber. The cross tie and timber division of the work is further closely related to the test work in the case of treated ties or timber. Where the road is not equipped with its own treating plant the inspection of the process of treatment and analysis of the creosote oil used is naturally handled by the laboratory force.

The time is coming, and the day is not far off, when the eastern roads will find it advisable to treat a portion, if not all the ties used each year. There is money made in treating ties and timber, and a large portion of this money may be reclaimed by the road that is progressive enough to have installed either under its own management or that of a reliable creosoting company one or more creosoting plants on its own line of road. These plants should be located either in the center of the tie producing districts on its own line, or at some seaport to which ties can be shipped at reasonable rates. The supervision of such plants in case they are owned by the railway or the inspection of the work at these plants in case they are operated by outside companies should be handled by the testing department.

An additional advantage and an advantage resulting in substantial savings to the company maintaining its testing department is the prevention of legal suits against the company. The very valuable records and reports contained in the files of the laboratory are of permanent value in case of damage suits, traceable to material or equipment failures. Suits have been withdrawn entirely as a result of unanswerable evidence and proof incorporated in the reports of the laboratory assistants who have been detailed to investigate the claims made by the complainant's attorney. A representative case of this sort arose when an oyster grower made complaint that the waste water from a roundhouse being contaminated with oil was killing his young oysters in an oyster bed located near the roundhouse. Under the direction of the chief chemist a small oyster bed was planted in the vicinity of the seat of trouble, and enough evidence secured to eliminate all of the liability on the part of the railway company to the oyster grower.

In addition to the tests and analyses of material, the inspection of equipment and investigations on special subjects pertaining to all branches of railway work, the testing department is in a position to handle the manufacture of numerous supplies on which a great saving may be shown. Among such supplies may be named dry fire extinguishers, charges for liquid fire extinguishers, boiler compound, hectographs, electrolyte, polishes, inks, paints and disinfectants. The question of policy places certain limitations on the manufacture of material by the railway. In many cases economy might result should the company manufacture an article which is made by factories on the line of road, but in such cases it is invariably better policy and better business judgment to patronize the home company rather than compete with it.

Discussion.—Among those who took part in the discussion were: H. S. Hayward, superintendent motive power of the New Jersey division of the Pennsylvania; Robert Job, of Montreal, Can.; Dr. P. H. Dudley, consulting engineer, New York Central & Hudson River; H. J. Force, chemist, Delaware, Lackawanna & Western; Geo. Post, Standard Coupler Company; C. E. Chambers, superintendent motive power, Central of New Jersey, and Eugene Chamberlain, chairman freight car repair pool New York Central lines. These gentlemen all demonstrated the value and importance of the testing department, but several of them took exception to Mr. Hinckley's suggestions concerning the relation of that department to the motive power and engineering departments; judging from the applause the greater portion of the large number of members present seemed to agree with them heartily. Unfortunately, Mr. Hinckley was unable to be present to reply to these arguments. The uselessness of having specifications and not having a test department to check the material was also emphasized.

HEAVY PACIFIC TYPE LOCOMOTIVE FOR THE VANDALIA.

Passenger service requirements have increased to such an extent on the Vandalia during the past few years that it has been found necessary to provide a heavier class of power for some of the trains. Until recently the standard passenger locomotive has been of the Atlantic type, having a total weight of 185,000 lbs.; weight on drivers 107,500 lbs.; cylinder, 21 x 26 in.; and a maximum tractive effort 24,650 lbs. In December, 1909, four heavy Pacific type locomotives were ordered from the American Locomotive Company. Prior to the advent of these engines the Vandalia was one of the few important roads in the country on which the Pacific type locomotive had not been adopted for at least the most difficult passenger service. In fact, because of the favorable service conditions, both freight and passenger traffic have hitherto been handled altogether by the lighter classes of motive power. The mogul type of locomotive is at present the standard class of freight power, the equipment including the heaviest examples of this type so far constructed. The last mogul engines built for the Vandalia by the American Locomotive Company had a total weight of 187,000 lbs., 159,300 lbs. on driving wheels, 21 x 28 in. cylinders, and a maximum tractive effort of 33,300 lbs.

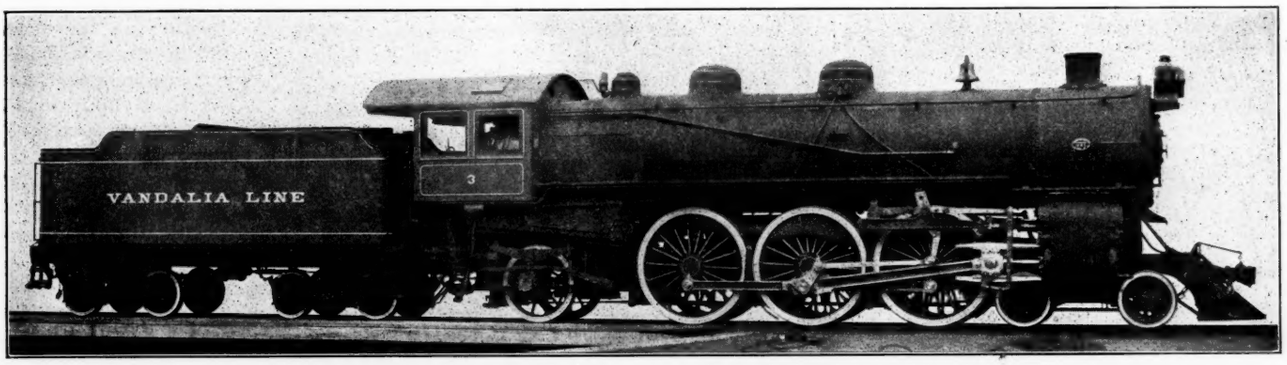
The Pacific type locomotives here illustrated have been in service for two months on the St. Louis division. Although designed for fourteen car trains, it has not had occasion thus far to handle more than twelve cars to a train. It is reported that the service with trains of that size has been satisfactory and gives every indication that these engines will have no difficulty in meeting the more severe requirements during the winter. Particular mention is made of the easy riding qualities of the engines at high speeds. They are operating under easy grade and curvature conditions. There are, to be sure, a number of portions of the road of from three to ten miles long where the curves are numerous; but the sharpest curve on the division is only 3 deg. 48 min., and there are long, straightaway stretches with very few curves.

As to the grades, the total rise between St. Louis and Summit, a distance of 217.8 miles, is only 474 ft. This rise, which is against eastbound traffic, is accomplished by a series of short, easy ascents over rolling territory with long stretches of practically level track between. Practically the only grade of any consequence against eastbound traffic lies between Reelsville and Almeda, where in a distance of approximately 8 miles, the total rise is 216 ft., giving an average gradient of 0.503 per cent. Going in the other direction, the grade conditions are still easier, there being several long, easy slopes in favor of westbound traffic.

The accompanying table, which was furnished by the Vandalia, gives a record of eight typical runs of some of the most important trains between Indianapolis and Terre Haute, and the latter place and St. Louis.

When the engines were first placed in service it was necessary to make some minor changes in the front end arrangement, which was the Vandalia standard. After that they steamed freely and no trouble was experienced. "Schedule Time" and "Running Time" in the above table includes in each case all stops. Trains 21 and 14 between Indianapolis and Terre Haute make three and two regular stops, respectively. Between Terre Haute and St. Louis train No. 7 makes four regular stops, and train No. 20, three.

An examination of the coal consumption indicates that the engine was not pushed to the limits of its capacity on any of the runs. It will be noticed that the highest rate of coal consumption per square foot of grate area per hour is only 74.5 lbs. The total amount of coal used per trip, in view of the tonnage and speed maintained, is also creditable.



Pacific Type Locomotive for Heavy Passenger Service on the Vandalia.

RECORD OF EIGHT TYPICAL RUNS OF VANDALIA PACIFIC TYPE LOCOMOTIVE.

Eng. No.	Train.	Date.	Run.	Dist. mi.	No. of cars.	(Tons) Tot. wgt. train incl. eng.	Sched. time incl. stops, h. m.	Run. time incl. stops, h. m.	Total water used, gals.	Approx. Total coal used, lbs.	Approx. Coal used pr. hr. lbs.	Lbs. of coal per sq. ft. grate area pr. hr.	Highest speed, m.h.p.	Exhaust tip, diam.
1	21	7-12-10	Indianapolis to Terre Haute*	73	10	800	1 42	1 40	5,700	7,000	4,200	74.5	60	6 in.
1	14	7-13-10	Terre Haute to Indianapolis†	73	10	825	1 50	1 50	5,700	7,000	3,818	67.5	60	6 "
1	21	8-3-10	Indianapolis to Terre Haute†	73	12	825	1 42	1 46	6,000	7,000	3,965	70.2	65	6¼ "
1	14	8-4-10	Terre Haute to Indianapolis‡	73	11	875	1 50	1 48	5,700	5,200	2,885	51.0	60	6¼ "
1	21	8-4-10	Indianapolis to Terre Haute§	73	8	715	1 42	1 34	5,100	6,000	3,830	67.8	65	6¼ "
1	7	8-12-10	Terre Haute to St. Louis†	175	7	650	4 30	4 13	12,400	13,000	3,085	54.6	75	6¼ "
1	20	8-13-10	St. Louis to Terre Haute¶	175	8	740	4 11	4 11	14,200	15,500	3,720	65.9	75	6¼ "
1	21	8-18-10	Indianapolis to Terre Haute**	73	9	710	1 42	1 36	5,800	6,000	3,750	66.3	75	6¼ "

* Engine steamed poorly, Indiana coal, heavy rain. † Indiana coal. ‡Indiana coal, heavy fog and mist. §Indiana coal, fine and dirty, heavy quartering winds. ¶Hard running train, Illinois coal. **Indiana coal, rain and quartering winds.

Although the design incorporates no new or unusual features, it is an excellent example of a straightforward, well proportioned design, carefully worked out to meet the particular conditions of service for which the engines were intended. As far as the cylinders and running gear are concerned, it is practically identical with the engines of the same type built by the American Locomotive Company for the Pennsylvania Railroad, the use of which was prohibited on the Vandalia road by the limit of 55,000 lbs. for the allowable load per driving axle. The principal differences between the two designs are a reduction of the boiler pressure from 210 to 200 lbs., and the use of a smaller boiler and firebox, the boiler of the Vandalia locomotives being 76½ in. in diameter outside at the first ring, while this dimension

on the Pennsylvania locomotives is 79¾ in. The boilers of both locomotives are of the straight top type, and the tubes in each case are 21 ft. long. The firebox of the Vandalia engines is 108⅛ in. long by 75¼ in. wide, having a grate area of 56½ sq. ft., while that of the Pennsylvania locomotive is 111 in. long by 80¼ in. wide, and has a grate area of 61.8 sq. ft. These modifications in design result in a reduction of 14,000 lbs. in the total weight of the locomotive, the Vandalia engines having a total weight of 256,000 lbs. as compared with a total weight of 270,000 lbs. for the Pennsylvania locomotives.

Although the reduction of 10 lbs. in the boiler pressure reduces the maximum tractive effort of the engines 2,600 lbs. as compared with that of the locomotive built for the Pennsylvania, at 60 miles per hour, there is only 600 lbs. difference between the tractive efforts of the two locomotives calculated in accordance with the builders' formula.

The general dimensions and principal ratios are as follows:

General Data.

Type	4-6-2
Fuel	Bituminous coal
Tractive effort	31,800 lbs.
Weight in working order	256,000 "
" on drivers	162,000 "
" of engine and tender in working order	401,900 "
Wheel base, driving	13 ft. 10 in.
" total	35 " 2½ "
" engine and tender	66 " 5 "

Ratios.

Total weight ÷ tractive effort	8.05
Weight on drivers ÷ tractive effort	5.09
Tractive effort × diam. drivers ÷ heating surface	579.63
Total heating surface ÷ grate area	77.68
Firebox heating surface ÷ total heat'g surf., per cent.	4.42
Weight on drivers ÷ total heating surface	36.91
Total weight ÷ total heating surface	58.32
Volume both cylinders, cu. ft.	13.58
Total heating surface ÷ vol. cylinders	323.19
Grate area ÷ vol. cylinders	4.16

Cylinders.

Kind	Simple
Diameter	24 in.
Stroke	26 in.

Valves.

Kind	Wilson piston
Diameter	14 in.
Travel	6½ "
Steam lap	1¼ "
Lead, forward gear	7/32 "
" back gear	7/32 "
" mid gear to equalize at 6½ cut-off	¼ "

Wheels.

Driving, diameter over tire	80 in.
" thickness of tire	4 "
" journals, main, diam	10½ x 14 "
" journals, others, diam	10 x 14 "
Engine truck, diameter	36 "
Engine truck, journals	6½ x 12 "
Trailing truck, diameter	55 "
Trailing truck, journals	8 x 14 "

Boiler.

Style	Straight top
Working pressure	200 lbs.
Outside diameter of first ring	76½ in.
Firebox, width and length	75¼ x 108⅛ "
" plates, thickness...C, ⅜ in.; T, ½ in.; S. & B, ⅜	"
" water space	4½ "
Tubes, number and diameter	383, 2 "
Tubes, length	21 ft.
Heating surface, tubes and firebox	4,195 sq. ft.
" firebox	194 "
" total	4,389 "
Grate area	56½ "
Center boiler, above rail	117 in.
Top smokestack, above rail	14 ft. 10¾ in.

Tender.

Tank, style	Water bottom
Frame	10 and 12-in. channel
Wheels, diameter	36 in.
Journals	5½ x 10 in.
Water capacity	7,500 gal.
Coal capacity	12 tons

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.

The twenty-eighth annual convention of the Roadmasters' and Maintenance of Way Association, held in Chicago at the Great Northern Hotel, September 13 to 16, inclusive, was noticed briefly in the *Railway Age Gazette* last week (page 523). That the association has entered on a new lease of life seemed to be believed by all those present. The manufacturers, who had exhibits in rooms near the convention room, organized to have a comprehensive exhibit at future annual conventions. Arrangements for the next convention, which will be held in St. Louis during October, 1911, are to be made by the officers of the association and the manufacturers' representatives jointly. The constitution and by-laws were amended so that a president of the Roadmasters' association will not be eligible for a second term until after the expiration of one year after his term of office. A committee was appointed by the president, on motion of A. M. Clough, supervisor of track, N. Y. C. & H. R., to make such changes in the constitution and by-laws as may be necessary to provide for the organization of a ladies' auxiliary, this committee to report at the next annual meeting. All reports presented were well discussed and the discussions were so animated and took so much of the time of the convention that some subjects scheduled for discussion were omitted.

CARE OF TRACK MATERIAL AND TOOLS.

The committee on Proper Care of Track Material and Tools recommended piling untreated ties, when received in rude form direct from the forest, on high ground with good drainage. Ties should be placed in cross tiers with 6 or 7 ties in each tier, with plenty of intervening space for thorough drying out and seasoning, the top tier to have the ties closely spaced and with one end higher than the other for drainage, this last tier serving as a roof for the pile. Where 200 or 300 ties per mile are required for renewal each pile should contain not more than 60 to 70 ties. If the tie renewals will not exceed 75 to 100 per mile the ties should be piled in V-shaped piles, each containing about 15 ties. Sod should be removed from around all piles for a distance of at least 6 ft., and no grass should be permitted to grow within 50 feet of any pile. It was recommended that all ties be placed in piles with the heart side down, and that they be placed in the same manner in the road bed. In dealing with treated ties the committee recommended that ties treated with zinc chloride be piled in the same manner as untreated ties to secure proper drying. Creosoted ties should be piled as closely together as possible to reduce evaporation as much as possible. To guard against fire and to assist in preventing the evaporation of the creosote earth should be placed over the piles of ties.

Switch ties, head blocks, crossing plank and fence lumber should be ordered only as required, should be piled separately according to size and used as soon as practicable after being received. In piling new and usable rail great care should be exercised in unloading and handling to prevent bending or breaking. A foundation of old timbers is recommended and the rails should be piled in tiers, the greatest span not exceeding 8 ft.

Switch material, rail and joint fastenings, spikes, bolts, nuts, etc., should be available for instant use and stored in sheds built to protect them from inclement weather. Everything should be assorted by kind and size, and all bolts well oiled to prevent rusting, while crossings, frogs and switches kept in stock for any length of time should receive a coat of cheap dark paint. Each section should have a sufficient amount of emergency rail to take care of rail breaks, the amount necessary being one emergency rail for each two miles of track in good healthy condition. One pair of emergency angle bars should be placed with each rail. The proper place for storage is at or near mile posts.

TOOLS.

The report on tools and scrap was as follows:

"Each section should be supplied with a sufficient number of first class tools, the very best that money can buy, as there is no greater waste of money than for a section crew to work with in-

ferior tools. The number of each kind would be governed by the number of men in each crew. In addition, each section should have a few pieces of extra tools for use in case of emergency, but no more than absolutely necessary to properly care for the work. A monthly inventory of all tools on a section should be rendered by the section foreman. In general, for ordinary repair work, the foreman should make his requisition on the roadmaster for tools and material once every thirty days and the foreman should be furnished with a small surplus of tools and material blank on which he should enter all tools on his section which will not be used for the next thirty days; this blank should be pinned to his monthly requisition and forwarded to the roadmaster at the close of each month. This will enable the roadmaster to transfer tools and material from one section to another and thereby avoid making requisition for supplies which he has on his division available for use. A great deal of money can be saved each month by having a system of this kind or a similar one. All tools as soon as they become dull or out of repair, so they will not do first class work, should immediately be sent to the shops for repairs and they should be put in good shape and returned to the section from whence they came, without delay.

"The hand car with a section crew should be the very best that can be obtained. It should be light as possible, but sufficiently strong to carry six or eight men and the necessary outfit of tools. There is no greater waste of money than to have a section crew running a poor hand car; thirty minutes in the morning and thirty minutes in the evening, day after day, on account of a poor hand car, runs into money very fast. The foreman should give his hand car very close attention; he should inspect it every morning before going to work and see that all bolts are securely fastened and that all bearings are clean and well oiled.

"Motor cars have been in use on some entire divisions in the past year or so, and with good results and saving some money. We recommend this feature of the car question be given consideration.

"Track tools of all kinds should never be used for any other purpose than that for which they are made. Track shovels should never be permitted to be used in holding up the end of ties while tamping, in pulling ties out of track or putting in new ones; nor should they be used for spacing ties in the track. Claw bars should not be forced under the head of a spike by hammering the heel with a spike maul; sufficient wood from around the head of the spike should be cut with an adz or sharp pick to permit the claw bar to grasp the spike head. Nor should they be used between the tie and rail to lift the rail. This will break the claw in a great many cases, especially in cold weather.

"Lanterns should always be kept in first class condition, ready for an emergency call, except that they should not be left standing or hanging up in the tool house with the cup filled with oil, as this will spoil the oil and rot the wick.

"When through with the day's work, all tools should be conveyed to the tool house and locked up for the night. Track gages and track levels should be tested frequently to ascertain if they are true and correct.

"All scrap should be picked up daily and placed with the other scrap where it can be secured by the scrap crew when required. We would recommend the scrap be picked up once a month. The scrap bin for small scrap should be provided at each section tool house with two compartments, each 4 ft. by 4 ft.; one compartment for small track scrap and the other for car scrap. We would recommend scrap bin at every section tool house and all scrap should be picked up daily and placed in it at the close of the day's work. Whenever any old worn-out wooden cattle guards or other worn-out equipment of this kind is burned as rubbish, all the bolts, nuts, washers or other metal should be picked out and conveyed to the scrap bin. When old tie piles are burned, the ashes should be raked over, and the old spike stubs, which in many cases are quite plentiful, should be picked up by the track men and saved as scrap. Its value will more than pay for gathering it up and it will educate the men in the matter of economy. Whenever any usable parts of cars or locomotives are picked up, such as draw bars, car doors, brake-shoes or any other usable material, they should be at once sent to the shops where they can again be made use of.

"In conclusion, we wish to say that the results obtained in the care of track material and tools, depend, in a larger measure than in any other part of their work, upon the interest taken in the matter by the foreman and his men, and we believe the surest way to bring about the results desired is to create a sense of the value of property among the men by continually impressing upon them the fact that all tools and material should be cared for just as conscientiously as if they were their own personal property. This impression will go fully as far as the most careful instructions."

The members present voted unanimously that hand cars be replaced by motor cars as rapidly as possible on all lines.

CATTLE GUARDS AND TIE PLATES.

The report on cattle guards was a recommendation of a certain kind of cattle guard, and the report on tie plates was a recommendation of a certain form of tie plate, both articles being widely advertised and well known. J. A. Kerwin (Mo. Pac.), offered as an amendment to the committee report on tie plates that it be received as information, and that the association adopt as an addition to the report the report of the Committee on Tie Plates presented in 1906, which report contained practically complete specifications for tie plates and avoided reference by name to any in the market. The report on cattle guards was also received as information without the report being adopted as the opinion of the association.

SWITCH TARGETS.

The report of the committee on Standard Switch Targets caused a discussion that lasted half a day. The discussion wandered from switch targets to interlocking switches and block signaling, threatening at times to encroach far into the field of signalmen. A motion was finally passed declaring it to be the opinion of the association that a single target switch stand should be standard on all single and multiple track lines. The vote was very close, being 25 in favor and 24 against, the members voting against being in favor of a clear indication. The committee report showed four out of six members of the committee as recommending that no target be shown for main line movements.

RAIL JOINTS.

The report of the committee on Insulated Joints and Rail Fastenings was received as information and filed. No recommendations were made by the committee, the intention being to mention all the joints in common use and draw out discussion. The discussion brought out nothing new; every roadmaster present was experiencing trouble with every form of joint and rail fastening used on his line and each man present hoped to get light from the other members.

INDIVIDUAL PAPERS.

The paper on "Treated Tie Timbers," by J. L. Single, was received as information, it being merely a resume of practice in tie treating, and the convention adopted a motion favoring creosoted tie treatment. The last paper on the program was by W. M. Camp, who discussed the proper methods committees should pursue in conducting investigations and reporting to conventions of practical men assembled for the purpose of solving problems and assisting others engaged in similar work as themselves.

The officers for the next year, and the place and date of the next meeting were given in the *Railway Age Gazette* of September 16, page 523.

The following is a list of the exhibits:

American Hoist & Derrick Co., St. Paul, Minn.—Photographs showing the "American" railway ditcher in operation. Represented by Edward Coleman.

American Steel & Wire Co., Chicago.—American Woven Wire right of way fencing, and steel fence posts. Represented by J. M. Holloway and L. P. Shanahan.

American Valve & Meter Co., Cincinnati, Ohio.—Models of Economy switch stands, showing different mechanisms. Represented by J. T. McGarry and F. C. Anderson.

Buda Company, Chicago.—Motor cars; new style Paulus drills; jacks; helical gears for hand cars. Represented by C. H. Delano, George B. Shaw, and A. R. Dyer.

Duntley Manufacturing Co., Chicago.—Duntley-Rockford No. 4 railway

section car and Duntley-Rockford No. 2 railway inspection car. Represented by G. A. Graber, H. F. Worden, R. F. Finan and E. J. Cornish.

Economy Separable Switch Point Co., Louisville, Ky.—Samples of the Palmer separable points. Represented by W. W. Mitchell.

Thomas A. Galt, Sterling, Ill.—Steel railway tie. Represented by Egbert W. Aument.

Indianapolis Switch & Frog Co., Springfield, Ohio.—Model of R.N.R. solid manganese frogs. Represented by J. C. Jameson.

Luitwieler Pumping Engine Co., Rochester, N. Y.—Model of Nonpulsating pump. Represented by E. D. Williams.

Pennsylvania Steel Co., Steelton, Pa.—Photographs and pamphlets showing the Never-Turn split bolt as applied to Manard anvil face frogs. Represented by R. E. Belknap.

Positive Rail Anchor Co., Louisville, Ky.—Samples of Positive rail anchors attached to rails. Represented by W. W. Mitchell.

Pruyn Reinforced Concrete Railroad Tie Co., Chicago.—Reinforced concrete tie. Represented by William H. Pruyn, Jr., and D. J. Avery.

Rail Joint Co., New York City.—Standard Continuous, Weber and Wolhaupter rail joints and insulated rail joints. Represented by F. A. Poor, W. E. Clark, F. M. Hill, Charles Jenkinson and H. C. Holloway.

Railway Specialty & Supply Co., Chicago.—Samples of P&M anti-rail-creepers. Represented by P. W. Moore, F. A. Preston, A. R. Sutter and George C. Johnson.

Ramapo Iron Works, Hillburn, N. Y.—Ramapo patent safety switch stand No. 17. Ramapo solid rolled switch slide and malleable brace. Represented by Arthur Gemunder, W. B. Lee and W. C. Kidd.

Vaughn Rail Support Co., St. Louis, Mo.—Samples of rail supports. Represented by T. E. Vaughn.

Verona Tool Works, Pittsburgh, Pa.—Prentice Diamond stone ballast tamping bar. Represented by William Heckler.

NEW YORK CITY FREIGHT TERMINALS.

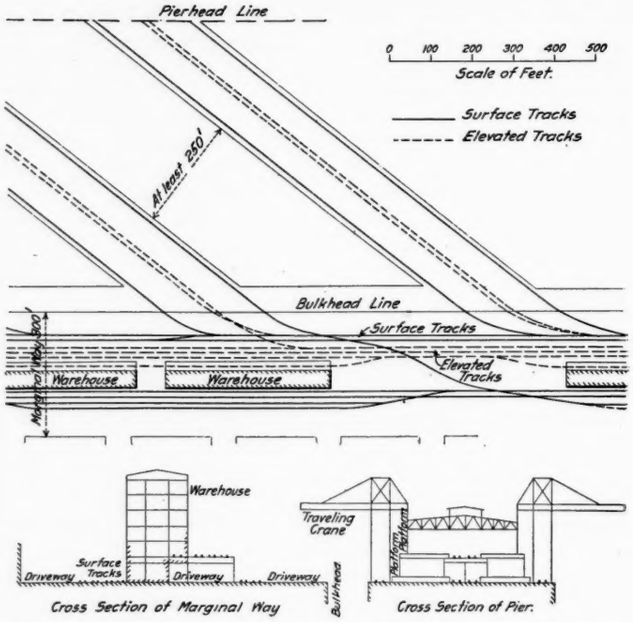
We are indebted to Gustave E. Lemmerich for the following comments on the terminal scheme proposed by Dock Commissioner Tomkins, briefly outlined in the *Railway Age Gazette* of July 22, p. 166:

The main features of the report are very good and on broad lines and it is more in regard to details that I would like to make some suggestions.

The report deals mostly with improvements on West street. The lower part of the North river on West street as far up as Canal street is to a great extent occupied by different railways, the space being used principally for delivering and receiving freight in small lots by trucks. North of Twenty-third street the railways have team yards, small freight houses, yards, etc. The business is mostly in car lots on team tracks and amounts to about one-third in cars, compared with the lower district. The increases in business have been considerably less than in the lower section. The close proximity of the railway facilities below Canal street to the wholesale and jobbing district accounts for this; the railways have built up at their respective locations a business, according to their facilities and their business abilities. The congestion of truck traffic in West street, below Canal street, is largely due to the fact that the railways have not enough lineal feet of frontage for receiving and delivering freight.

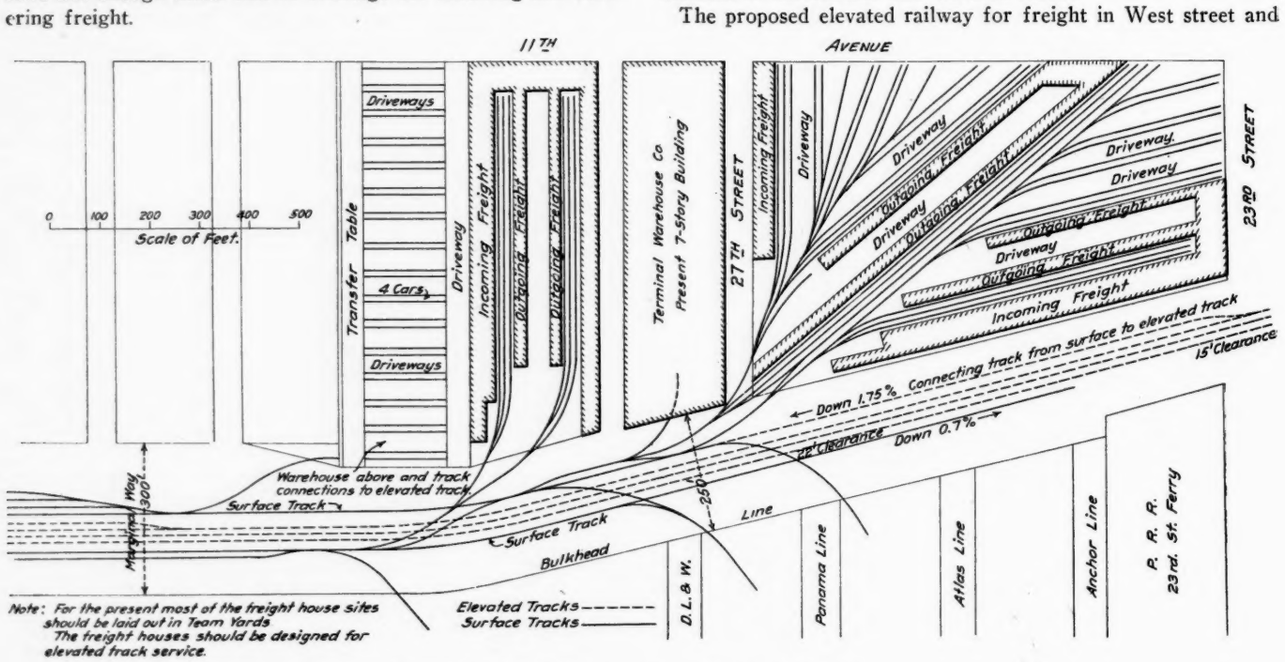
In any improvement plan these features should be given fair consideration. It might prove a pretty hard undertaking to take over the railway properties, leases, etc., for a nucleus of a joint freight terminal, but it might be considerably easier to assist the individual railways to enlarge their holdings and improve the same on modern and more economical lines. The city should assist in a rearrangement of certain streets, etc., to make feasible layouts possible.

The district from Forty-second to Sixtieth streets is at present the most available for modern ocean pier improvements. A modern ocean pier should be at least 150 ft. wide and about 1,000 ft. long, and should have at least 250 ft. of space between piers. To get this length, the piers have to be built on an angle to the bulkhead. The piers should be equipped with modern appliances for handling freight from ship to pier and also for transferring the same lengthwise in the pier. There should be elevators between the stories. They should also have track connections to the surface and elevated tracks.



Part of Typical Layout North of Forty-second Street.

The proposed elevated railway for freight in West street and



Suggested Layout near Twenty-third Street.

the proposed surface tracks at certain points will facilitate freight movements immensely. The elevated should be connected with the surface tracks at certain points.

By making the marginal way at certain districts 300 ft. wide, instead of 250 ft., terminal buildings could be placed alongside the elevated railway and one track could run inside of the building. The building could be 60 ft. wide at the elevated track level and above 40 ft. wide at the ground level.

The space under the elevated structure could be utilized for a roadway and the surface tracks could be at the other side of the building, making freight and warehouse facilities conveniently located to the piers and only occupying 40 ft. of width. This extra width of the marginal way might be also easier and cheaper to obtain than a solid block.

If the terminal buildings be located in blocks, they should be so arranged as to have a width of about 60 ft., built on similar lines as the new warehouses of the Bush Terminal Company, in South Brooklyn.

It will be a very hard matter to operate the transfer bridges if located in a bunch, as proposed, both as regards car floats and as regards switching of cars. These transfer bridges should be separated, so that several can be operated at the same time.

Several of the terminal buildings, as proposed near Canal street, should be provided for, if possible one for each railway, so that the railways could keep their individuality in freight receiving and delivery. The one terminal building, as proposed, would enormously congest the street traffic in that vicinity. Detail plans for these buildings should be very carefully studied. Of the two accompanying sketches, one indicates a pier and warehouse arrangement and the other shows different freight house and team yard layouts. For the present, most of the freight house site should, however, be laid out in team tracks. The transfer table layout for team yard might prove advisable when the property gets too expensive to waste room for the switches. The pyramid design shown in the cross section of the pier (which design is protected by copyright), gives platform space in front of the openings into the pier shed, so that freight may be dropped there by the crane and left temporarily instead of having to be swung into the shed at once.

This whole West Side improvement is of such vast importance that it demands the best talent of terminal engineers and transportation experts, and it should be treated the same as great architecturai designs; that is, it should be open to competition.

DOUBLE TRACK IN NORTH CAROLINA.

An officer of the Southern Railway writes that the double track on that road between Greensboro and Charlotte has been extended farther than was shown in the map printed with our article of September 2, page 393. The work is now completed for the whole distance between the cities named, except for about five miles south of Concord. The terminus of the double track southward from Greensboro is one mile north of Concord; and that of the line north from Charlotte is at Coddle Creek, 16 miles from Charlotte.

In Prussia a passenger was directed to a car where the heating apparatus was frozen up, and during the whole journey didn't get thawed out. He caught cold, and brought suit for his doctor's bills. The court decided that not only had he failed to prove that the illness was due to the lack of heat in the car, but declared that the passenger had no claim to have the car heated at all, and on appeal this decision was affirmed. This is probably a continuation of the legal status which existed not so long ago on European railways, when cars were either not heated at all or so imperfectly that passengers were expected to carry wraps and rugs enough to keep themselves comfortable, as if they were in a stage coach.

TRAIN ACCIDENTS IN AUGUST.[1]

Following is a list of the most notable train accidents that occurred on the railways of the United States in the month of August, 1910. This record is intended to include usually only those accidents which result in fatal injury to a passenger or an employee or which are of special interest to operating officers. It is based on accounts published in local daily newspapers, except in the case of accidents of such magnitude that it seems proper to write to the railway for details or for confirmation:

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	No. persons reported Kil'd.	Inj'd.
1.	N. Y. C. & H. R.	Oriskany.	rc.	P. & Ft.	1	0
†8.	N. W. Pacific	Ignacio.	bc.	P. & Ft.	12	24
†10.	Union Pacific	Lenape.	rc.	Ft. & Ft.	2	1
11.	N. Y., N. H. & H.	Maromas.	xc.	P. & Ft.	1	3
12.	Western Pacific	Oakland.	xc.	Ft.	3	0
13.	Western Pacific	Marysville.	xc.	Ft. & Ft.	1	1
†13.	Seabrd A.L.-South.	Raleigh.	xc.	P. & P.	4	14
13.	Ches. & Ohio	Handley.	xc.	Ft. & Ft.	4	6
16.	Chic. M. & St. P.	Tomahawk.	xc.	P. & Ft.	1	5
18.	Norf. & Southern	Raleigh.	bc.	P. & Ft.	2	0
19.	Pennsylvania	Plymouth, Ind.	rc.	Ft. & Ft.	1	2
21.	Cent. Vt.	Northfield Falls.	bc.	Ft. & Ft.	6	3
21.	G. Rapids & Ind.	Nottawa.	bc.	P. & Ft.	1	3
22.	Western, Md.	Edgemont.	bc.	Ft. & Ft.	5	3
22.	Texas & Pacific	Aledo.	rc.	Ft. & Ft.	1	2
†24.	Grand Trunk	Durand, Mich.	rc.	P. & P.	10	7
26.	Georgia Nor.	Pecan City.	bc.	Ft. & Ft.	5	4
26.	Missouri Pac.	Blackwater.	bc.	Ft. & Ft.	5	1
28.	St. L., I. M. & S.	Van Buren.	bc.	P. & Ft.	1	2
29.	Balt. & Ohio	Newark.	xc.	Ft. & Ft.	1	2

Derailments.

Date.	Road.	Place.	Cause of derlmt.	Kind of train.	No. persons reported Kil'd.	Inj'd.
5.	D., L. & W.	Analomink.	runaway.	Ft.	2	2
5.	Erie	Howells.	slide.	Ft.	3	0
7.	Pennsylvania	Canton, Ohio.	beam.	Pass.	0	0
9.	Dul. & I. R.	Ely.	d. switch.	Pass.	1	0
9.	Rock Island	Tucumcari.	washout.	Pass.	1	1
12.	Western Pacific	Oakland.	neg.	Ft.	4	14
*13.	Louisville & Nash.	Covington.	unx.	Ft.	1	2
†16.	Mo. Pacific	Horton.	unx.	Pass.	1	35
17.	Southern.	Rockton, S.C.	d. track.	Pass.	0	15
22.	St. Louis & S. F.	Memphis.	unx.	Ft.	1	1
23.	C., St. P., M. & O.	Osseo.	unx.	Pass.	0	13
23.	Chic. & Alton	Coal City.	unx.	Ft.	1	2
28.	Rock Island.	Little Rock.	unx.	Pass.	1	1
30.	Seaboard A. Line.	Exley.	washout.	Pass.	2	..

The butting collision south of Ignacio, Cal., on September 8, in which 12 persons were killed and 24 injured, was between a northbound passenger train and a southbound work train. The engine of the work train pushed the passenger engine to one side and then plunged completely through the baggage car and smoking car of the passenger train. Most of the victims were passengers in the smoking car, all of the killed being passengers. The work train had been switching at Ignacio about two hours. It then received orders for the despatcher to proceed southward, but these were subject to the general rule requiring it to wait there for two northbound passenger trains; but it waited for only one, and the collision resulted. Both the conductor and the engine man of the work train had examined the train register at Ignacio, and both were men of experience. They set their train on the side track to await the arrival of the two northbound passenger trains, both of which were due within twenty-five minutes after the time at which the running orders were delivered to them. Things that they said in conversation with the agent, when they received their orders, indicated that they knew that they should wait at Ignacio for these two regular trains. The conductor claims to have absolutely forgotten that a second passenger train was due. The engineman was seriously injured and at last accounts was lying in the hospital, most of the time unconscious.

In the rear collision at Lenape, Kan., on September 10, two drovers were killed. A live stock train of the Rock Island road ran into the rear of a preceding freight of the Union Pacific, which was at a standstill. Both of these companies use the Union Pacific tracks at this point.

[1] Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction—unx, unexplained ——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

The collision at Raleigh, N. C., on September 13 occurred at the Union Station at about 1 o'clock in the morning. A passenger train of the Seaboard Air Line, entering the station, struck an excursion train of the Southern Railway, wrecking one of its cars near the rear end.

The butting collision at Northfield Falls, Vt., on the morning of September 21, was between a northbound freight train and a southbound train, consisting of an engine and caboose. Both trains were running at a speed of probably 35 to 40 miles an hour. Both conductors, one engineman, one fireman, one brakeman and one unidentified man (supposed to have been a tramy in a box car) were killed and three trainmen were injured, but not seriously. The collision was due to the failure of the operator at Northfield to deliver a train order, which he had received, to the northbound train. The operator is twenty years of age and had been permanently employed at Northfield since July 14.

In the rear collision of eastbound passenger trains on the Grand Trunk, two miles east of Durand, Mich., on the night of August 24, about 11 o'clock, ten passengers were killed or fatally injured and 5 passengers and 2 trainmen were less severely injured. The wreck took fire and some of the passengers were burned to death. The leading train was No. 14. It had been stopped on account of the brakes sticking and the engineman and fireman of that train, who were under their engine, were badly injured. The following train was No. 4, which leaves Chicago 45 minutes behind No. 14. The rear car of No. 14 was a sleeping car and in this were most of the victims. This car was totally destroyed by fire. It appears from the reports that the flagman of the standing train went back with stop signals, but there is a conflict of testimony as to how far he went and whether he displayed his red light effectively. A coroner's jury found the brakeman (George M. Graham) guilty of gross negligence and the engineman (Charles Spencer) guilty of negligence, though the company had suspended Spencer, as the one chiefly or wholly to blame, and had kept Graham on his regular run. The newspaper reports say that the tail lights were dim or dead when the train left Durand and that Graham was a green man (there had just been a strike of trainmen).

The derailment at Analomink, Pa., on Sept 5 was due to a freight train of 62 cars becoming uncontrollable on a descending grade of 78 feet to the mile. At a sharp curve, the twenty-third car was derailed and, with the thirty-four cars next behind it, was ditched, most of the wreck being piled up in a narrow cut*. These cars took fire, probably from a car loaded with oil cake, and all of them with contents were burnt up. The forward part of the train ran a quarter of a mile farther, when the engine and twenty-two cars were derailed on a tangent, caused by diving wheel tires heating. They fell off, and the wheel centers struck a frog at a siding. The engineman and one brakeman were killed and two other trainmen were injured. The engineman was unable to control the train. The failure of the air was due evidently to improper manipulation. Upon starting down the grade, there was full supply of air, and there was also full steam pressure. The air and all the brake appliances were properly tested at the prescribed place, and as prescribed in the rules, before the train started down the grade. The engineman controlled the train properly for the first nine miles, and without calling for assistance, after which the conductor noticed on the caboose indicator that the train line pressure was diminishing. The train man, and also the fireman, went out on top of the train to set handbrakes, but the speed accelerated so rapidly that they were unable to check it.

From an account in the Washington (N. J.) *Star* we take the following particulars of this accident:

When the manifest freight, No. 52, ran down Pocono mountain last Friday morning so fast that a towerman could distinguish nothing more than a solid streak of cars, one of the operators called up the despatcher at Scranton and said:

"No. 52 just passed here. She is running away."

"Oh, I guess she's not running away; she's just making good time," answered the despatcher .

A minute or two later No. 52 was piled up in the worst wreck that the Lackawanna has ever experienced. Not that the loss of life was so severe, but out of the great train of 67 cars, only the six next to the caboose escaped complete demolition. The wreck occurred shortly before 3 o'clock near the Analomink station, about three miles north of Stroudsburg. The train parted in Hinds' cut, an eighth of a mile above the Analomink station, and here the rear end was wrecked, 37 cars piling up level with the 30-foot rock embankment. The engine and 19 cars continued their mad flight a mile and a half farther down the road on a perfectly straight line. At the point of a switch leading to a siding the engine left the track. This crash took place almost directly opposite Sherman Van Vliet's residence.

No pen can picture that terrible flight down the steep grades and around the sharp curves of the Pocono mountains in the darkness of night. The speed attained by the runaway train was remarkable. One operator says that seven miles were covered in four minutes. The swing of the freight cars was so great that trainmen could not make their way across the tops to apply the hand brakes. The hotel keeper at Spragueville, aroused by the whistle of the runaway engine, peered out of a window as the train passed. He says that the car wheels looked like rims of fire, due to the set brakes.

The Pocono mountain grade on this side is 28 miles long. It is thought that the train ran uncontrolled some nine or ten miles. That this distance was covered without accident is remarkable. The wreck occurred on the last curve before the straight track was reached. The prayer of the crew on the runaway train was that the straight track would be reached in safety. Therein seemed to lie their hope. Nearly half the train went around the last curve all right. Then one of the cars left the track and those which followed piled up.

The front part of the train rushed onward with speed unchecked. The wheels of the engine and cars were red hot. Finally, the tires on the engine drivers expanded, loosened up and the broken driving rod hammered the track for a distance of half a mile, some of the wheels remaining on the tracks and others pounding the ties. Spokes from the driving wheels were found in the creek along the route of the runaway and large parts of the broken driving rods were distributed along the embankment. The crippled engine, still traveling at tremendous speed, finally turned turtle and landed in Sherman Van Vliet's dooryard, the following 19 cars piling up in frightful shape immediately behind it.

George Coglizer of Scranton, aged 65 years, who had been an engineer on the Lackawanna road for 32 years, was engineer of the ill-fated train. His fireman was Wm. Boerman of Hoboken.

The fireman suspected that the train was running away and went into the engineer's cab to learn the trouble. Coglizer told him that the air wasn't working and that the train had the best of him. The fireman then went back on the train and, with the other members of the crew, started to set the handbrakes. The momentum of the train was too great and the heavy load got the better of the crew and gathered speed at every foot. Disaster came when the foot of the mountain was reached.

Engineer Coglizer stuck to his post and met death when the engine left the tracks and overturned. The engine turned a somersault, landing wheels uppermost, the tender going above it and lodging further on. The engineer was ground to pieces, portions of his body being gathered up the next day.

Head brakeman, Wm. Ryan, was the other man to lose his life. The exact manner in which he met his death is not known, no trace of his body having been discovered. He was probably cremated in the burning cars at Hinds' cut.

Fireman Boerman was thrown clear of the wreck and landed in a field near the track. Thos. Cannon, the flagman, was thrown from the cars and escaped luckily. Both these men sustained some broken bones and bad scalp wounds, but have since recovered sufficiently to leave the Monroe hospital. Cannon is about 60 years old and this makes the 17th wreck that he has experienced during his long railway career. What part conductor Robert

Ruegg of Scranton played in the wreck is not known. He was in the caboose and escaped without injury, but he seems to have mysteriously disappeared since the wreck.

The shattered engine, No. 583, still lies upside down in a field alongside of Van Vliet's house. The shattered cars, nothing remaining but twisted iron work and splintered timbers, have been moved out of the way of traffic. There is not a car in the lot that bears any resemblance to a freight car.

It was in the cut at Hinds' crossing, however, more than a mile north, where the rear portion of the train was wrecked, that the great disaster occurred. The twentieth car in the train left the track at this point in coming around the sharp curve and plunged with frightful speed into the rock cut. The cars behind naturally piled on top of it and it almost challenges belief to state that the narrow cut, more than 30 feet high, was piled with wrecked cars considerably more than even with the top. Two or three carloads of granite blocks added to the momentum of the train and plunged their full weight into the mass of demolished cars. Behind them came some oil cars and with almost human malevolence these piled upon top of the wreckage and poured their contents upon the fearful heap. The red-hot wheels did the rest. The mass ignited and there was a fearful conflagration.

Flour and feed, saturated with oil, burned like inflammable material; baled hay added heat to the flames, and lumber and other materials contributed their part in making a roaring, seething mass out of the monstrous heap of wrecked cars.

Scranton and Stroudsburg firemen got there shortly after daylight and worked for several hours in fighting the awful 30-foot mass of burning wreckage in the cut, but nothing they could do with water or chemicals was of avail against the action of the oil-soaked mass and the heap was permitted to burn itself out.

How completely it did this may be explained in the statement that not a stick of wood as large as a man's hand was left of the 37 freight cars that were consumed. Nothing remained except the bent and twisted iron work and the carwheels and axles. Some of the carwheels had been subjected to such intense heat that they were melted into a mass. This statement hardly seems creditable, but it is true.

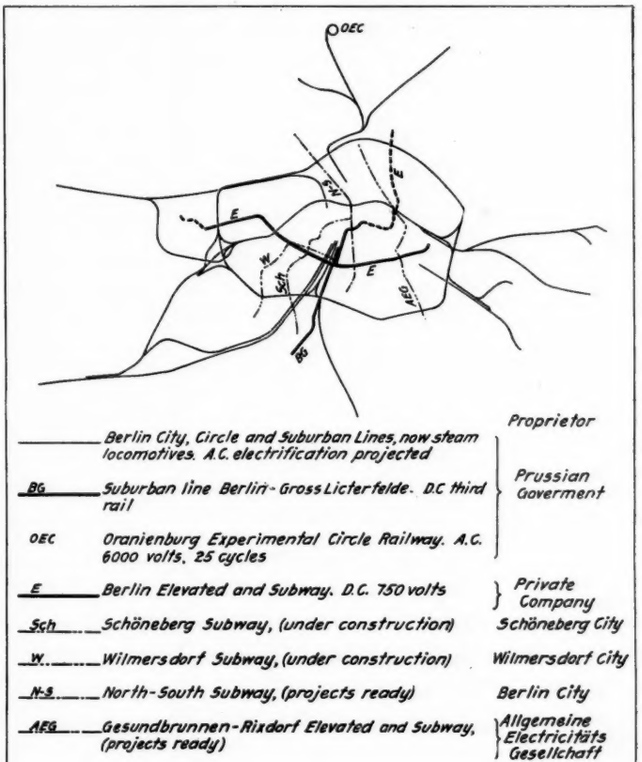
Practically the whole wrecking force of the Lackawanna hurried to the scene immediately after the wreck. The sight which greeted them was such, and the wreck was so extensive, that they didn't know where to begin to clean it up. Both tracks in Hinds' cut were blocked from Friday morning at 3 o'clock until Saturday afternoon at 3 o'clock, 36 hours. One track was opened at this time and No. 3 was the first train to go through. It was not until Monday that both tracks were reopened for travel. All passenger trains traveled over the Lehigh Valley from Scranton to Phillipsburg while the tracks were closed. No freight was moved Friday or Saturday and none was accepted at shipping points.

Of the five accidents to electric cars in the United States, which we find recorded in the newspapers in August, only one is reported as resulting in fatal injury. This was a butting collision at Rager, Ohio, on the 11th. One passenger was killed, and four were injured. On the Gorge railroad at Niagara Falls on the 15th there was a butting collision, in which 10 persons were injured, but it came very near precipitating a carload of passengers into the whirlpool rapids. According to a local paper, "the cars, each with a string of trailers—six in number—were crowded with tourists. The block signal system refused to work, and when the northbound car came from back of the abutment of the cantilever bridge the motorman applied his brakes, but they refused to work and the cars came together with terrific momentum, the northbound car being on a steep grade. The southbound car was turned around at right angles, and with its load of passengers balanced on the embankment, threatening any moment to topple into the rapids, in which case every person in it would have been swept to death. The front vestibules of both cars were reduced to kindling wood while the rear ones were also smashed by the weight of the loaded trailers."

THE ELECTRIC RAILWAYS IN GERMANY.

BY WILHELM WECHMANN,
Government Chief Engineer, Royal Prussian Railways.
TRANSLATED INTO ENGLISH BY A. WALSER LEMBECK.

While traveling in the United States during the past year and viewing the very interesting electric main line, city and interurban railways, I was obliged to confess my astonishment and to admit that Germany has not advanced as much in the electrification of railways as has the United States. This is not by any means due to the fact that Germany has not endeavored to advance in electric railway engineering. The reasons are



Map 1—Berlin City and Suburban Lines.

that the distances between cities are not as great in Germany as in the United States, and the German railway companies have been very cautious in investigating the practical electrifications of their main lines, as well as determining the necessary investment required.

However, electric railway science in Germany during the last ten years has made wonderful progress, and is well worth describing.

The electric railways may be divided into street railways, interurban railways and city and suburban railways. A part of the railways that we have in Germany, passing between two or more communities, have the characteristic of the street railway, that is, they do not travel under the signal system, because they are compelled to make so many stops, and a trip between two stops is composed principally of acceleration, coasting and braking.

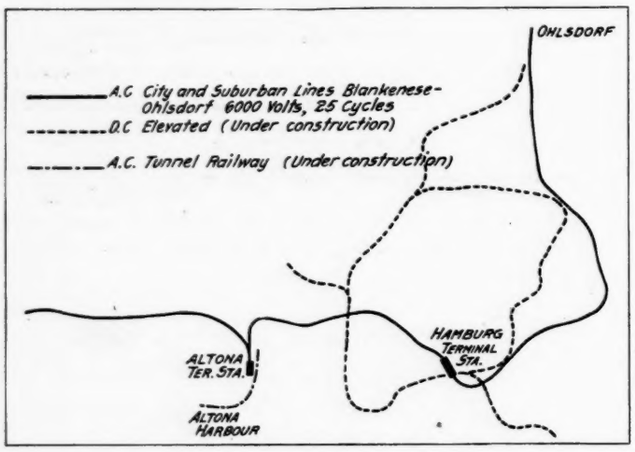
In Table 1 is found the most important data on street railways. Column "A" gives the figures on the various street railways in Germany, and in column "B" will be found those of Greater Berlin and 30 of its suburbs, part of these consisting of underground suburban lines. These figures refer to the year 1908. In the column marked "Items," 18 is composed of the operating expenses, which also include the premiums which are fixed by law for the insurance against sickness, accident and disability of employees. This item also covers the taxes and road maintenance.

In most cases these railways are operated on from 500 to 600 volts, current being transmitted over the usual trolley wire, and collected with the ordinary trolley wheel mounted on trolley pole; also, in some cases, collected on a bow. The fare on these railways is, in general, two and a half cents.

Some of the railways, which may be classed as light interurban railways, are used for the light traffic which passes to the more distant points outside of the large cities. While these hold a prominent place among electric railways, they do not terminate with the main lines. They are, of course, operated in the same manner as the street railways. These railways have made wonderful progress in the last 20 years, especially during the last few years, and are eventually taking the place of the steam railways. In the year of 1892 we had 11 interurban railways, and in the year 1908 this number was increased to 253, only 26 of which are electrified. Data of these railways is to be found in Table 1, column "C."

The city and suburban railways, which are elevated roads, traverse the city, passing over the beautiful iron and stone viaducts and subways which are to be found in Germany. They differ from the main interurban lines by their closer schedules, and the cars differ from those of the street railways, in their greater length and speed. The principal cities having suburbs connected by these railways are Berlin, Hamburg and the twin cities Elberfeld-Barmen. Data of these railways will be found in Table 2.

The Berlin elevated and subway railway was the first electrified railway in Germany. The first part was built in the years 1897-1902. These trains follow the routes outlined in Map 1, and start from the central traffic point in Berlin, which is Leipsiger Platz, going in three directions. One branch is composed of the subways that run to the business centers of the city, and will be extended to the northern part of the city during


OHLSDORF
A.C City and Suburban Lines Blankenese-Ohlsdorf 6000 Volts, 25 Cycles
D.C Elevated (Under construction)
A.C. Tunnel Railway (Under construction)
HAMBURG TERMINAL STA.
ALTONA TER. STA.
ALTONA HARBOUR

Map 2—Hamburg Electric Railways.

the next few years. The second branch is the elevated road, passing to the thickly populated residence districts, located in the southeastern part of the city. The third branch travels for a short distance on the elevated viaduct and then through the subway to the western part of the city, from which point it extends to Charlottenburg, this being one of the largest and most prominent suburbs of Berlin. This section of the road will also be increased in length very soon. It has its own power house, situated near Leipsiger Platz; is supplied by direct current at 750 volts, and has a third rail system; but is so equipped that it can be operated on three-phase current, which is supplied from a sub-station in the western district.

In the near future a new and larger power house will be erected in this district. The number of passengers carried on these railways has increased from 20,000,000 in 1902 to 49,000,000 in the year 1908.

The Berlin-Gross Lichterfelde was formerly a steam road and was electrified in 1903. It starts from the Leipsiger Platz and runs to different southern suburbs. The trains run on a 10 minutes headway and consist of from three to four motor cars, which are coupled to the ordinary steam railway coaches. The owners of this railway purchase their power from nearby power houses at 1.67 cents per kilowatt hour.

The Schoeneberg Subway runs through the city of Berlin with its 2,000,000 inhabitants, through its various subways, and reaches

Table I.—*Data of Street Railways and Light Interurban Railways.*

Items.	A All street railways.	B Greater Berlin (Berlin and 30 suburbs).	C Light interurban railways.
Population served	62,000,000	3,013,000	62,000,000
Total number of street railways.*	251	8	253
Total number, electric street railways.	204	8	26
Electric Railways:			
Number of motor cars	10,368	1,841	394
" " electric locomotives	.....	.....	12
" " trailers	7,352	1,293	279
" " passenger cars	17,720	3,134	673
" " freight cars	915	.....	290
" " employees	50,000	11,000	2,000
Miles of all routes	2,360	247	270
Number of passenger-car miles	353,400,000	71,840,000	.....
" " motor-car miles	262,900,000	53,350,000	8,074,000
" " locomotive miles	.....	.....	53,000
" " passengers	2,050,000,000	528,400,000	34,000,000
Invested capital	$231,700,000	$44,900,000	$1,390,000
Revenue from passenger traffic	46,430,000	11,000,000	.....
Total revenue	48,100,000	11,300,000	1,900,000
Total expenses	29,800,000	7,300,000	1,430,000
Net earnings	18,300,000	4,000,000	470,000
Number of persons killed	256	28	15
Number dangerously injured	1,000	205	37

*Electric, steam, horses, cars, etc.

30 communities, which together comprise a million people. Among these, to the west and southwest, are the flourishing cities of Charlottenburg, with its 270,000 inhabitants; Schoeneberg, 160,000, and Wilmersdorf, 85,000, with their widely scattered residence districts.

These cities are always striving to protect their independence from Berlin, and are doing their utmost to encourage the comfortable and rapid transit of their citizens to and from the center of Berlin, with a view of securing more residents. On the other hand, the residents of the larger cities are also encouraging the building of subways. The only two now completed are the Schoeneberg and Wilmersdorf subways. The Schoeneberg subway makes connection with the Berlin City & Circle Railway at its southern terminus, and travels under several main streets of Schoeneberg, finally passing over the elevated and subway railways, until it reaches the heart of Berlin. The southern portion is almost completed.

The Wilmersdorf subway runs west, paralleling the Schoeneberg railway, then through the eastern corner of Charlottenburg, and continues not far from the Berlin elevated and subway railway, with which it has a joint terminal.

The city of Charlottenburg is also planning the construction of a subway to Berlin, but these plans have not as yet reached completion. Some weeks ago the province of Weissence, which is northeast from Berlin, also communicated with the city of Berlin relative to securing a fast train connection.

The city of Berlin is planning to build a subway during this year, to run north and south, under the city. This railway will pass under the main streets of traffic, such as Friedrichstrasse, and will be obliged to accommodate a constant and great amount of travel. A surface railway is impossible in these narrow business streets, and is not allowed in similar streets in the immediate vicinity.

The motor cars of the proposed subway are to be equipped with d.c. motors, which are designed for a terminal voltage of a thousand volts. The power will be supplied by high tension, three-phase system, from the large power plants in the city of Berlin, and will be transmitted to underground adjacent substations and converted to the proper voltage for the motors.

Further fast train connection is being contemplated through the city of Berlin, from the northwest to the southeast and on to the adjacent city of Rixdorf, the construction of which will be part elevated and part subway, and will be d.c. motors. The

equipment will be furnished by the Allegemeine Elektricitäta Gesellschaft.

The Berlin City Circle & Subway Railways, shown on Map 1, branch out in all directions. Trains passing to the suburbs are marked in heavy lines.

Various distances of these roads are double-track, and will eventually have four tracks, and the trains, for the present, will be driven by steam locomotives. The trains traveling through Berlin from west to east, and also within a short radius from the city, 2½ minutes headway, and are composed generally of 10 coaches, with a seating capacity of approximately 480. In the past year plans have been made whereby these railways will be electrified. It is assumed that the system will be 10,000 volts, but on account of the high cost of its construction, it has been postponed until its practicability can be definitely ascertained from the experiments which will be conducted between Dessau and Bitterfeld.

The Blankenese-Ohlsdorf City & Suburban Railway was the first single-phase railway of the world, and is the property of the Kingdom of Prussia. It was opened in 1907, after the Prussian railway department, during the previous year, had made exhaustive tests with single-phase current. The government is indebted to Mr. Wittfeld, private and chief assistant to the royal Prussian railway ministry, who has accomplished wonderful work in connection with the electrification of this road.

The cities of Hamburg, with its 860,000 inhabitants, and Altona, with 175,000 inhabitants, are connected by this road, together with several nearby suburbs. The longest trains consist of eight coaches, two of which are close coupled, or in other words, termed double cars. There are, at the present time, approximately 84 in use, and 25 more will be delivered in the near future.

The trains are equipped with the multiple unit control system. This road possesses its own power house, which contains five turbo-alternators, the total amount of power delivered being 1,250 kw., and two similar turbo-alternators are at present in course of erection. The voltage generated in this power house is 30,000 volts, and is being transmitted to sub-stations and fed to the overhead wires at 6,000 volts, this being a 25 cycle system. Notwithstanding the fact that the atmosphere in the vicinity of Hamburg is very moist, this road has proven to be absolutely safe in operation. The route of this road is shown on Map 2.

The Hamburg elevated railway, which will use d.c. motors, is being constructed by the city of Hamburg. It will run in a loop around the middle of the city, from which three branches will extend. A small distance of the road in the old part of the city will be under the ground, but the greater part will be elevated over the new broader streets. It will be of the third rail system, the third rail carrying 800 volts d.c., and will receive its power from sub-stations, power being generated at the central station at three-phase 6,000 volts. This road will be opened next year.

The cities of Bermen-Elberfeld and Vohwinkle, with a joint population of 250,000 people, are in the western part of Germany, where many thriving industries are located. In this section of the country there is a very narrow valley, in places only 1,500 ft. in width, and through the middle of this valley flows the Wupper river, a small tributary of the Rhine. The traffic through this valley is steadily increasing, but because of the very narrow streets an elevated road is impossible. Moreover, the river affords a good highway for traffic.

Along the mountainous shores of this river a railway has been built and where the valley broadens it passes over the streets. One difficulty in the construction of this railway was the many curves necessitated by the windings of the river, and the best method of construction was believed to be found in the suspension of the cars. Another thing to be considered was the comfortable accommodation of the public in these cars. Great study was given to overcoming the centrifugal forces which arose as the car made the various curves.

Operation of this monorail line was begun in 1900, and up to the present time there has not been an accident, blame for which could be laid to method of its construction. The radius of the sharpest curves on the line is 276 ft. The loop and at the ends of the line have curves of 26 ft. radius, over which the trains travel very slowly. The trains are composed of two coaches only. While this suspended railway is, without a doubt, a very interesting piece of engineering, it is not practical for heavy traffic, since the trains can only be composed of two coaches.

The larger part of the main line electric railways are under the direction of the states, since these railways would play a prominent part in the defense of the country in the event of war. Table 3 gives some very interesting data concerning the main lines which are electrified.

The Rhine Shore railway is owned by a private company and was put in operation in the year 1906. This road connects the two cities, Cologne with 460,000 inhabitants, and Bonne, 85,000 inhabitants. It has both local trains and fast expresses, the latter making one stop only between the cities. The trains have electric motor cars, with trailers. The trains making the frequent stops are equipped for 500 volts d.c., and the fast trains with 1,000 volts d.c., which is transmitted by an overhead wire. The voltage is transmitted direct to each motor, which is capable of developing 130 h.p. The motors, which weigh 5,000 lbs., are of the inter-pole type and run without sparking, width of the commutator segments being ⅛ of an inch.

The power house is situated about midway between the two termini of the road, and consists of two generators of 330 kw.

TABLE II.—*List of City and Suburban Railways.*

	Berlin and suburbs.							Hamburg and suburbs.		
	Working		Under construction	Completed.			Working.			
Items.	Berlin elevated and subway.	Suburban Ry., Berlin-Gross Lichterfelde.	Schoeneberg subway (1st part).	Wilmersdorf Subway.	North-South Subway.	Gesundbrunnen-Rixdorf elevted & subway.	Berlin City, Circle & Suburban Railways.	Blankenese-Ohlsdorf City & Suburban Railway.	Under construction. Hamburg Elevated.	Elberfeld & Barmen. Working. Suspended Railway (monorail)
Proprietor	Private Company.	Kngdm of Prussia.	Schoeneberg City	Wilmersdorf City.	Berlin City.	Private Company.	Kingdm of Prussia.	Kngdm of Prussia.	State of Hamburg.	Private Company.
Total length constructed lines, miles.	11.1	5.8	0.0	.....	.....	.....	250	16.6	.....	8.25
Miles under construction or projected	3.2	0.0	2.1	4.6	4.7	6.0	.....	.....	17.4	.....
" elevated constructed	4.9	0.0	0.0	0.0	0.0	2.0	.....	.....	3.4	8.25
" subway constructed	6.2	0.0	2.1	0.0	4.7	4.0	.....	.....	4.2	0.0
No. of stations	23	6	5	.....	12	11	140	17	33	21
Av'ge distance between stations, ft...	2,657	5,970	2,560	.....	2,234	3,182	.....	5,478	2,780	2,181
No. of motor cars	114	24	.....	.....	.....	.....	.....	2x84	.....	42
No. of trailers	87	.....	.....	.....	.....	.....	.....	.....	.....	8
Total No. of passenger cars	201	.....	.....	.....	.....	.....	.....	.....	.....	50
No. of employers and workmen	1,400	.....	.....	.....	.....	.....	.....	.....	.....	275
Kind of current on the cars	D.C.	D.C.	D.C.	D.C.	D.C.	.....	A.C.	A.C.	D.C.	D.C.
Voltage on the cars	750	550	780	.....	1,000	.....	10,000	6,000	800	500
Kind of transmission current	3-phase.	Not exist'g	3-phase.	.....	3-phase.	.....	Sngl phase	Sngl phse.	3-phase.	Not existing.
Voltage of the transmission current..	10,000	Not exist'g	6,500	.....	6,000	.....	50,000	30,000	6,000	
No. of car-miles	6,580,000	2,200,000	.....	.....	.....	.....	.....	.....	.....	1,760,000
No. of passengers	48,600,000	.....	.....	.....	.....	.....	202,500,000	34,100,000	.....	11,090,000
Invested capital	16,200,000	.....	.....	3,700,000	14,300,000	20,000,000	.....	.....	10,700,000	3,700,000
Total revenue	$1,580,000	.....	.....	.....	.....	.....	.....	.....	.....	316,000
Total expenses	$795,000	.....	.....	.....	.....	.....	.....	.....	.....	184,000

capacity, the voltage generated being 1,000. This railway differs from the light interurban railways in that it has a signal system and contains bridges over the tracks, and the depots are larger.

A similar railway will be built within the next few years for passenger traffic between Cologne and Düsseldorf, the distance between these two cities being 25 miles, and also between Düsseldorf and Dortmund, 47 miles. This will probably be of the single-phase system.

The Prussian Government has devoted considerable time to the development of this railway, which is of the single-phase system. The road shown on Map 1 was built near Oranienburg for experimental purposes, and various locomotives and motor cars have been tried out here in the past few years. In the year 1907 the government designed an eight-wheel freight locomotive of 1,050 h.p., which has covered in test 600 miles in 20 hours. This test, combined with other numerous tests, has shown the possibilities of the electric locomotive.

The Dessau-Bitterfeld railway is 16 miles in length, and is part of the greater lines Magdeburg-Halle and Halle-Leipsig, total length of these roads being 95 miles. These, also, are owned by the Prussian Government. The road handles both passengers and freight, and are now using steam locomotives. The plan is to eventually erect a power house and electrify this road, current to be transmitted by overhead wires. In this vicinity lignite coal is found in abundance, and this fuel will be used for the production of power.

The government has already placed an order for two electric passenger and four electric freight locomotives, which will be of the high mounted motor and side rod type. The electrical equipment will be furnished by five of the large German manufacturing companies, one of which will furnish two locomotives and the others one locomotive each, there being a very interesting competition between these companies for the furnishing of the future electrical equipment. In the most of these locomotives the control will be through a potential and induction regulator. They will be equipped with Deri motors, the control of these being accomplished by the shifting of the brushes. It is contemplated that this road will be electrified during this year.

The Altona-Harbor Railway is shown on Map 3, and connects Altona harbor, which is 70 ft. deep, with the Altona terminal station. The greater part of the traffic is freight. The railway runs, for the greater part, through a tunnel under the streets of Altona, the trains at present using steam motive power. Due to the fact that the smoke question has been greatly agitated, the trains are run on a 20 minutes headway. It is planned to make this a single-phase railway. Traffic figures, etc., are given in Table 3, and a profile of this road is shown on Map 2. A locomotive for this road is at present being built, which will be equipped with induction regulator, and it is expected that the electrification of this road will be completed this year.

The Wiesenthal railway is owned by the Grand Duchy of Baden. The motor power of this system is steam, and the road is situated in the extreme southwestern section of Germany, the southern part of which contains the Black Forest. The road has a 1 per cent. grade, and it is expected that the main part of this line will be electrified. Power will be purchased from a power house located on the Rhine and supplied at 6,800 volts, three-phase, 50-cycles, and will be converted at various sub-stations into single-phase, 15-cycles, and will then be stepped up to 10,000 volts to the overhead trolley, and probably will be stepped up to 30,000 volts at some sub-stations. Locomotives which are being built will be of the high mounted motor and side rod type.

The Royal Bavarian Railways, which run through the western part of Bavaria, are also to be electrified, and extensive hydro-electric plants are contemplated for the generation of power.

Power supplied to the electric railways thus far treated has been through the third rail and overhead wires. On certain stretches of various roads having very light traffic motor cars generating their own power are of great importance. This has been demonstrated in both the United States and Germany. It has been found impracticable to design steam motor cars, but considerable experimenting has been conducted with the storage battery motor car or locomotive, also with the benzol electric motor cars. The Prussian Railway department especially has done much experimenting with the storage battery motor cars, and has in its service at present over 100. These are mostly of the double car type and have been designed by Mr. Wittfeld. The batteries contained in this type of car are placed on the front trucks. The batteries contain a charge sufficient for 90 miles.

The benzol electric cars and the storage battery cars are very strong rivals. About a year and a half ago one of the benzol motor cars was perfected in Germany, and this has proven so satisfactory that eight more were built, after the design of Mr. Wittfeld. The locomotive is similar to the American design. The benzol engine or gasolene engine is direct-connected to a generator, which supplies power for the motors, under the car body, and mounted on a specially designed frame which rests on the axles. The vibration from the machinery is, therefore, not transmitted to the passengers. The entire car, up to the motorman's cab, is designed for the use of passengers. This motor car carries benzol for traveling 125 miles.

The above gives an outline of the electric railways in Germany at the present time.

Table III.—*List of the Electric Main Lines.*

Items.	In operation		Under construction			
	Rhine Shore Railway.	Oranienburg Experimental Circle Ry.	Dessau-Bitterfeld, first part of Madgeburg-Halle-Leipzig Trunk Line.	Altona Harbor Railway.	Wiesental Railway.	Salzburg-Berchtesgaden Line.
Proprietor	Private Company.		Kingdom of Prussia.		Grand Duchy of Baden.	Kingdom of Bavaria.
Length of line, miles	17.6	1.1	16.1*	1.5	31	25
Maximum speed, miles per hour	50	Not stipulated.	78	10	50	50
Kind of current on the line	Direct cur.	Single phase.	Single phase.	Single phase.	Single phase.	Single phase.
Voltage on the line	1,000	6,000	10,000	1,500	10,000	10,000
Number of cycles on the line	.....	25	15	25	15	15
Kind of current transmission	.....	.....	Single phase.	Single phase.	Single phase.	Single phase.
Voltage transmission	.....	.....	60,000	6,000	30,000	.....
Number of cycles transmission	.....	.....	15	25	15	.....
" " motor cars	10	.....	0	0	.....	.....
" " trailers	10	.....	0	0	.....	.....
" " locomotives	0	.....	6	1	12	.....

*The total length of Magdeburg-Halle-Leipzig is 95 miles.

The Congo Railway has had to come down, and July 1 reduced rates on iron and steel wares, parts of engines, etc., from 35 cents to 8½ cents per ton-mile, which amounts to $37.40 per ton from Pittsburg to New York. The road is a short one, but it connects with thousands of miles of river navigation, connected by short sections of railway, above it; and at the extreme end are copper mines which cannot be worked at the old rates, and hardly at the new ones.

General News Section.

The Missouri, Kansas & Texas has increased the wages of telegraphers from $7.50 to $15 a month.

In a collision of express trains near Rottenmann, Austria, September 20, seven persons were killed and 29 injured, four of them fatally.

Near Oporto, Portugal, on the same day, an excursion train was derailed and 150 persons were injured, though none was killed.

The Cincinnati Car Demurrage Bureau has been disbanded, and in the matter of demurrage each road will look after its own interests.

Employees of the Atchison, Topeka & Santa Fe are taking measures to erect a monument to the memory of their late general manager, James E. Hurley.

In the Federal court at Lynchburg, Va., September 17, the Baltimore & Ohio was fined $200 and the Norfolk & Western $800 for violation of the safety appliance laws.

The new line of the Chicago, Milwaukee & St. Paul, between Hastings, Minn., and Cologne, is nearly, or quite, completed, and, by use of this line through freight from Chicago to the Pacific coast will be carried over a shorter route and will be kept out of the crowded St. Paul terminals.

The car repairers of the Southern Pacific in Texas, who went on strike about three weeks ago, have returned to work. The strike seems to have been settled under a temporary agreement which was to be followed by conferences between the officers of the road and representatives of the employees.

The Railroad Commission of Illinois has called upon the railways of the State to attend a meeting at Springfield, October 4, to consider a proposed order to increase the percentage of air-braked cars to be run in trains. At present the percentage required by the law of Illinois is 50. It is proposed to increase this to 75 per cent.

Charles W. Miller, United States District Attorney, has filed suits in the federal court in Indiana for penalties amounting to $13,000 against the Grand Rapids & Indiana and the Pittsburgh, Cincinnati, Chicago & St. Louis, for alleged violations of the law in allowing or requiring trainmen to work for more than sixteen hours continuously.

Governor Stubbs, of Kansas, has called a meeting of governors and business men of western states, to be held at Topeka on September 22, to consider means of preventing the railways from advancing their freight rates. The governors invited are those of North and South Dakota, Nebraska, Oklahoma, Texas, Arkansas, Missouri, Illinois, Iowa, Wyoming, Colorado and Utah.

Prof. George F. Swain, of Harvard University and of the Boston Transit Commission, has been appointed superintendent of the work of appraising the property of the New York, New Haven & Hartford in Massachusetts, in accordance with an order of the last legislature. Prof. Swain reports to a special board consisting of the railway commissioners, the tax commissioner and the bank commissioner.

The passenger trains of the Worcester, Nashua & Portland division of the Boston & Maine are to be run into the Union station at Portland (going over the Maine Central from Deering Junction), instead of to the old station of the W., N. & P. at Preble street; and the freight trains of the W., N. & P. will begin and end their trips at Deering Junction, which is four miles from the Union station.

The New Orleans, Mobile & Chicago has paid to the State of Mississippi a fine of $500 imposed by the court of Pontotoc county, for the action of the company in building a line around the town of Pontotoc, instead of through it, as ordered by the State Railway Commission. The State won its contentions in several lawsuits, but finally compromised with the road by securing this payment as a fine for contempt of court.

The New York State Public Service Commission, Second district, has refused to authorize the New York Central to discontinue the use in the electric zone of bridge ticklers—warnings to prevent brakemen from striking their heads against overhead bridges. The company decided to abandon these guards, because in this zone it is no longer necessary for employees to go on the tops of cars. The petition of the road was opposed by the brakemen's brotherhood.

The Cincinnati, Georgetown & Portsmouth, which a few years ago was changed from steam to electric, is petitioning the Ohio State Railroad Commission to class it as an interurban line instead of a steam road. The C., G. & P. has a steam charter, but finds that under this instrument it must pay a tax of 4 per cent. on its earnings, whereas if classed as an interurban the rate would be but three-twentieths of one per cent. The company still operates a few steam locomotives to haul freight.

President Mellen is quoted in Massachusetts as saying that the Boston & Maine is preparing to use electric locomotives in the Hoosac tunnel. This tunnel is 5 miles long, and the line is double track. The electric power would be used from a point east of the tunnel to North Adams, which is about two miles west of the tunnel and which is a division terminal. With the heavy traffic now carried over this division of the road, the smoke nuisance in the tunnel is often oppressive. There is an ascending grade from each end to the center.

It is expected that the State Tax Commission of Ohio will permit the collection this year of the taxes on railway business by the old system, notwithstanding the fact that the last General Assembly enacted a law changing the method from a mileage basis to a computation on the earnings within the state. It was found that under the present system of accounting, the calculation of the taxes would require examinations of several millions of waybills. The railways on July 1 began separate accounting and will be able to make the desired returns a year from now.

Suit has been begun at Grand Rapids in behalf of the state of Michigan to collect $3,000,000 back tacxes from the Detroit-Grand Haven & Milwaukee, controlled by the Grand Trunk. Under its charter of 1860 the road pays only a tax of 1 per cent. on its capital stock. The stock is nominally $2,517,140. The state contends that the capital actually invested in the road can be used as a basis for taxation, instead of the shares appearing on the company's books. The state seeks to set $7,000,000 as the capital stock as a basis for taxation and thus collect additional taxes of about $50,000 a year.

The Old Time Telegraphers' and Historical Association, at its meeting in Chicago September 9, voted to join in the movement for the erection of a monument at Turner, N. Y., the station from which was sent the first telegraphic train order. The committee in charge of this project now consists of: E. P. Griffith (Erie), chairman; C. Selden (Baltimore & Ohio), E. A. Chenery (Missouri Pacific), W. J. Camp (Canadian Pacific), J. B. Taltavall (*Teiegraph and Telephone Age*), Col. W. B. Wilson, president Old Time Telegraphers' and Historical Association, and F. J. Scherrer, secretary of the same.

The members of the Traffic Club of St. Louis were the guests of the Kansas City Railroad Club of Kansas City, Mo., on September 17. The visitors were entertained by a ball game, which a team composed of members of the Traffic Club of St. Louis won by a score of 15 to 2. In the evening there was a dinner at which addresses were made by Mayor Darius Brown, Wallace A. McGowan, formerly president of the Kansas City Railroad Club; George J. Tansey, president of the Traffic Club of St. Louis; J. F. Holden, vice-president of the Kansas City Southern, and H. G. Wilson, transportation commissioner of the Kansas City Commercial Club.

The ferry from Oakland by which the Southern Pacific carries the traffic of its overland line across the bay to San Francisco is four miles long. To avoid this transfer the company has just opened a freight line around the southern end of the bay, which is over 50 miles long. The Bay Shore cut-off, which

is a part of this line around the bay, was completed some time ago, and has been described in the *Railway Age Gazette*. That part of the line which crosses the bay near its southern end, known as the Dunbarton cut-off, has just been finished and freight trains began running regularly over it on September 12. The Dunbarton cut-off connects Newark, on the east side of the bay, 27 miles from Oakland, with Redwood, on the west side of the bay, 29 miles from San Francisco. A line now under construction from Newark northeastward toward Sacramento will still further facilitate the movement of overland freight by shortening the distance between Newark and Sacramento. The principal bridge in the Dunbarton cut-off consists of pile trestle approaches, 1,002 ft. long on the east side, and 5,366 ft. long on the west side, and the bridge proper, 1,390 ft. long, including a draw span 310 ft. long. At the draw the water is 50 ft. deep with a tide variation of 12 ft. The Southern Pacific has bought, near Newark, 500 acres of land on which to establish yards.

Delay in Completion of the Moffat Road.

David H. Moffat, who is in New York on business connected with the Denver Union Water Co. and the Denver, Northwestern & Pacific Railway, says that as soon as financial arrangements can be made the railway will be completed to Salt Lake City and the tunnel constructed through the Continental divide.

Any arrangements that Mr. Moffat enters into for securing capital for the completion of the road will include the financing of the tunnel construction and the laying of a branch line to connect with the Denver & Rio Grande at Dotsero, about 75 miles northwest of Leadville.

At present the road is completed to Steamboat Springs, 210 miles from Denver. Its cost, including equipment, was approximately $13,000,000, or about $60,000 a mile. Cost of constructing the remaining 360 miles will be about half that per mile, as there are no more mountains to cross. The surveys have all been completed to Provo, the route following down the Bear river valley in northwestern Colorado and up the Du Chesne valley in Utah. Mr. Moffat expects to arrange for trackage rights from Provo into Salt Lake City. Cost of the tunnel has been estimated at between $5,000,000 and $6,000,000.

Mr. Moffat also owns the survey for the Denver & Rio Grande cutoff, which will save that road over one hundred miles into Denver. This branch, which will be about forty miles long, will follow down the Rio Grande river from a point near Orestod on the Moffat road, about sixty miles southeast of Steamboat Springs, to a junction with the Denver & Rio Grande at Dotsero.

"This is the greatest railway proposition in the world to-day," says Mr. Moffatt. Anyone who talks with him about it can see that he has ambition to carry it to completion. Maybe the fact that E. H. Harriman told him the road could not be built strengthens this ambition.

Regarding Mr. Harriman he says: "We had a talk before I began the road, but we could not agree. Everything possible was done to block my plans for financing the road, but I put $10,000,000 of my own money into it and built across the mountains. At present the road is earning all fixed charges, and if we were not paying for new equipment out of income, it would be showing 2 or 3 per cent. on the stock."

Mr. Moffat says that he is disinclined to put more of his own money into the road; but that if arrangements for further financing are not made before the $4,000,000 notes of the Colorado-Utah Construction Co., which is building the road, fall due next May, he will pay them off himself.

The Denver, Northwestern & Pacific is capitalized at $10,000,000 non-cumulative 5 per cent. preferred stock, $10,000,000 common and $22,500,000 first mortgage 4 per cent. bonds. All the stock and $20,000,000 bonds are to be issued for construction, the bonds at the rate of $40,000 a mile. Of both classes of stock $5,450,000 is outstanding, Mr. Moffat owning nine-tenths of it. Bonds to the amount of $10,900,000 have been issued, of which $8,000,000 are deposited as collateral for the $4,000,000 notes of the construction company. One million are held in England.

Mr. Moffat realizes that his road will be of great value as a connecting link across the backbone of the continent for some of the large systems. He says: "You can say that the road has no entangling alliances or agreements with any trunk line. If I should part with it after it is completed, I would rather it would be to either the Chicago, Rock Island & Pacific, or the Chicago, Burlington & Quincy." He pointed out when the Union Pacific was mentioned that it could probably not legally acquire the Moffat road. The interests of the city of Denver will also be a factor in determining what system gets the Moffat road.—*Wall Street Journal.*

Unsecured Claims Law Prevents Railway Construction in Texas.

B. F. Yoakum, chairman of the St. Louis & San Francisco, has written a letter to a committee of business men of Alice, Tex., informing them that the St. Louis, Brownsville & Mexico has rescinded its decision to build an extension of this road to Alice. A. T. Perkins, its vice-president, had indicated to the people of Alice just before he left for Europe a short time ago that the branch would be built. Mr. Yoakum explains that the decision not to build is due to the passage by the Texas legislature of the measure known as the "International & Great Northern bill," which was enacted to require any purchaser at foreclosure of this road to pay the unsecured claims against it before he could take title. Mr. Yoakum said in his letter:

"To round out our system in Texas so as to traverse large sections now remotely located from existing railroads, and waiting for them to aid their development, we have considered the construction of from 700 to 800 miles, and at $35,000 a mile for building, ballasting, equipping and furnishing terminals, would require $28,000,000, the majority of which would be spent for Texas materials and supplies (such as commissary, feed, etc.). The line from Kingsville north to Alice is a part of our general plan. To build and ballast the twenty-five miles necessary to reach Alice would, without including additional equipment necessary for that new mileage, cost approximately $550,000 to $600,000, as there is not much bridging and no heavy work to encounter, and would not cost up to the general average on a large construction mileage. As we go north from the Gulf coast of Texas we encounter a broken and more expensive country through which to construct, thereby increasing the general average cost."

He added that he knew nothing about the merits of the law in question, but that it had had the effect of making financiers regard Texas as a bad place to invest their money. He continued:

"There have been several people to see me in the last few weeks with new railroad enterprises in Texas. While this bill may be declared unconstitutional by the courts, I don't honestly believe that any new railroad enterprise whose mortgage does not ante-date the enactment of this law, can sell bonds at 50c. on the dollar, for new railroad construction in Texas, if such bonds are not guaranteed by some existing railroad system. I know of one specific case where the construction of approximately 350 miles of railroad was being financed through the Panhandle of Texas to the Rio Grande that has been indefinitely postponed, and will probably not be taken up again for some time, if at all. Investors of money, especially those of trust funds, or for estates, scrutinize very closely the character of investments, and they would not feel justified in buying a first mortgage bond which in reality would not, under all circumstances, prove to be a first mortgage; nor would they take the risk of buying a lawsuit with the State to test the validity of the law. I am afraid we are 'hung up' on new railroad construction for some time. The very fact that the bill did pass with only a vote of seven members of the House and four of the Senate against it may cause people to feel uneasy until the people who are earnestly working for the development of the state make it clear that they are not in sympathy with such legislation."

Pennsylvania Trespassers in Jail.

Tramp train riding is pretty popular, but it leads to the county jail nowadays. The report of the number of persons confined in the Dauphin county prison during the year 1909 has just been made public. It shows that 7,333 persons were committed for various offenses, of which number 1,762 served terms for illegal train riding and 335 for trespass. The total expense to the county was $23,355.22.—*Philadelphia Record.* Dauphin county is that in which is situated Harrisburg, an important division terminal of the Pennsylvania Railroad. This road has pursued a vigorous campaign against the tramps.

Proposal for a Subway in Broadway, New York.

The Hudson & Manhattan Railroad, operating subways across the Hudson river, has sent to the New York State Public Service Commission a proposal looking to the operation by the Hudson & Manhattan of the new subways to the Bronx which are soon to be built. The company proposes, also, to build a line from the present Hudson terminal at Cortlandt street northward through Church street, Wooster street, University place and Broadway to a connection with the present Hudson subway at Sixth avenue and 33rd street, thus making a through line from Cortlandt street to the Grand Central Terminal at 42d street and Park avenue. The Hudson & Manhattan would take a lease for a comparatively short term, say 25 years, and would divide the profits equitably with the city.

Indianapolis Railway and Mechanical Club.

This is the name of a new organization of mechanical men connected with the railways operating in the vicinity of Indianapolis, Ind. At the organization meeting, held September 14, the following officers were elected: President, F. C. Pickard, master mechanic, C., H. & D.; vice-president, C. M. Stark, general foreman, Indiana Southern; secretary, B. S. Downey, chief clerk to master mechanic, C., H. & D.; treasurer, T. F. Griffin, foreman, P. & E.; executive committee, F. G. Skeen, road foreman of engines, C., C., C. & St. L., and W. W. Scott, general foreman, C., H. & D. The next meeting of the club will be called by the president, probably within the next 30 days.

New Railway Mileage in 1909.

In our issue of September 9 there was published an abstract from the introduction to Poor's Manual for 1910, in which it was said that the increase in mileage in the United States during the calendar year, 1909, totalled 6,310 miles. It should have been pointed out that this total included the mileage of railway which had never been reported to Poor's, in addition to the mileage built during 1909. The increase in mileage, on account of new construction, was 3,476 miles. This compares with an increase in new mileage of 3,918 miles, built in 1908.

American Society of Civil Engineers.

At the regular meeting held on September 21 the following papers on the New York tunnel extension of the Pennsylvania Railroad were presented: "The Long Island Approaches to the East River Tunnels," by George C. Clarke, M. Am. Soc. C. E.; "The Sunnyside Yard," by Louis H. Barker; "The Lining of the Four Permanent Shafts of the East River Division," by F. M. Green, Assoc. M. Am. Soc. C. E. These papers were printed in the August number of the Proceedings.

Transportation and Car Accounting Officers of Texas.

Some twenty car accounting and transportation officers of the railways in Texas met in Houston, September 10, and organized an association. It is proposed to have meetings every three months. The following officers were elected: President, D. B. Keiser, car accountant, Galveston, Harrisburg & San Antonio, Houston; vice-president, F. A. Lister, superintendent, Galveston, Houston & Henderson, Galveston; secretary-treasurer, R. A. McDowell, car accountant, International & Great Northern, Palestine.

American Street and Interurban Railway Association.

The secretary has sent out convention bulletin No. 3, which relates in general to the railway rates and special train arrangements for the convention of the association and its affiliated and allied associations, to be held at Atlantic City, N. J., October 10-14, 1910.

Western Railway Club.

At the regular meeting held on September 20 a paper, entitled "Automatic Connectors for Freight and Passenger Train Cars," was given by Willis C. Squire.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting June 22, 1911; Niagara Falls, N. Y.
AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn.
AMERICAN ASS'N OF LOCAL FREIGHT AGENTS' ASS'N.—G. W. Dennison, Penn. Co., Toledo, Ohio.
AMERICAN ASS'N OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew Bldg., Cincinnati, Ohio.
AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; semi-annual, Nov. 16; St. Louis, Mo.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Oct. 18-20; Denver, Colo.
AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASS'N.—E. H. Fritch, Monadnock Bldg., Chicago; March 21-23, 1911; Chicago.
AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 6, 1911; Detroit, Mich.
AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Building, Chicago.
AM. RAILWAY TOOL FOREMEN'S ASS'N.—O. T. Harroun, Bloomington, Ill.
AM. SOC. FOR TESTING MATERIALS.—Prof. E. Marburg, Univ. of Penn., Phila.
AM. SOC. OF CIVIL ENGS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and Aug.; annual, Jan. 18-19, New York.
AM. SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York; annual, Sept. 27-29; St. Louis, Mo.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 29th St., New York; annual, Dec. 6-9; New York.
AMERICAN STREET AND INTERURBAN RAILWAY ASS'N.—H. C. Donecker, 29 W. 39th St., New York; Oct. 10-14; Atlantic City.
ASSOCIATION OF AM. RY. ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911; New Orleans, La.
ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911; Montreal, Can.
ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—G. B. Colegrove, I. C. R.R., Chicago; annual, Sept. 27-30; Chicago.
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911; Boston.
ASS. OF TRANS. AND CAR ACC. OFFICERS.—G. P. Conard, 24 Park Place, N. Y.; Dec. 13-14, Chicago; June 20-21, 1911, Cape May City, N. J.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
CANADIAN SOCIETY OF CIVIL ENGS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays; Montreal; annual, last week January.
CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; Chicago.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
ENGINEERS' SOCIETY OF PENN.—E. R. Dasher, Box 704, Harrisburg, Pa.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton Bldg., Pittsburgh; 1st and 3d Tues.; annual, Jan. 17, 1911, Pittsburgh.
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R.R., Richmond, Va.; 20th annual, June 21, 1911; St. Paul, Minn.
GENERAL SUPERINTENDENTS' ASS'N OF CHICAGO.—H. D. Judson, 209 Adams St., Chicago; Wednesday preceding 3d Thursday; Chicago.
INDIANAPOLIS RY. AND MECH'L CLUB.—B. S. Downey, C., H. & D., Indianapolis, Ind.
INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.
INTERNAT'L RY. FUEL ASS'N.—D. B. Sebastian, La Salle St. Station, Chicago.
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.
INT. RY. MASTER BLACKSMITHS' ASS'N.—A. L. Woodworth, Lima, Ohio.
INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
MASTER CAR BUILDERS' ASS'N.—J. W. Taylor, Old Colony Bldg., Chicago.
MASTER CAR AND LOCO. PAINTERS' ASS'N OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass.
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, ex. June, July, Aug. and Sept.; Boston.
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
NORTH-WEST RAILWAY CLUB.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.
NORTHERN RAILWAY CLUB.—C. L. Kennedy, C., M. & St. P., Duluth; 4th Saturday; Duluth, Minn.
OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Blk.; Second Wed.
RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City; 3d Friday in month; Kansas City.
RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa., 4th Friday in month, except June, July and August; Pittsburgh.
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.; annual, Oct. 11-13; Richmond, Va.
RAILWAY S'KEEPERS' ASS'N.—J. P. Murphy, Box C. Collinwood, O.; annual, May, 1911.
RICHMOND RAILROAD CLUB.—F. O. Robinson; 2d Monday; Richmond.
ROADMASTERS' AND MAINTENANCE OF WAY ASS'N.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct., 1911; St. Louis.
ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Oct. 25 and 26; Hotel Chamberlin, Old Point Comfort, Va.
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. R. Ry., Montgomery, Ala.; annual, Oct. 20; Atlanta.
SOUTHERN & SOUTHWESTERN R.R. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., Mar., July, Sept. and Nov.; Atlanta.
TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo; 1st Sat.; annual, May 6, 1911, Toledo.
TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 13; Buffalo.
TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.
TRAIN DESPATCHERS' ASS'N OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911; Baltimore.
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo.
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg; 2d Monday, except June, July and August; Winnipeg.
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; Wednesdays, except July and August; Chicago.

Traffic News.

The Texas law, making the signature of an agent on a bill of lading the same in law as the act of the carrier, goes into effect November 1.

The railways of Texas hauled into Galveston during the month of August 143,841 bales of cotton, an increase of 89,943 bales over the amount handled in August, 1909.

The Tennessee Central now enjoys favorable traffic relations with both the Illinois Central and the Southern, the suits brought by these two companies against the T. C. having been amicably settled.

The Interstate Commerce Commission has suspended until January 5 a tariff presented by the Vicksburg, Shreveport & Pacific announcing advances in the rates on yellow pine lumber to points in many States.

Railway employees are asking business men in Kansas City to sign petitions to the Missouri railway commission, requesting it to make no further reductions in rates, on the ground that this will compel reductions in the wages of railway employees.

At the Ohio Valley Exposition, now being held in Cincinnati, the principal railways of the Southern states have combined to make a single large display of the agricultural, mineral and forest resources of the South. This exhibition fills 30,000 sq. ft.

Local freight agents are reported as now quite generally refusing to quote interstate freight rates in writing, unless the request for such rates is presented in writing. This is to guard against the penalty of $250 for mistakes in making such quotations.

The committee of St. Louis railways which is seeking a location for a union ticket office in the business district between Broadway and Ninth streets and Chestnut and Locust streets, has finished its investigation, and it is understood that some action may be taken soon.

The tonnage raised in the Houston & Texas Central district prior to the agreement was handled by the Missouri, Kansas & Texas and the St. Louis & San Francisco systems. Under the agreement of 1909 the tonnage was to be moved over the Kansas City Southern line.

The traffic agreement entered into between the Kansas City Southern and the Union Pacific and the Southern Pacific on February 5, 1909, has been modified in part, giving to the Kansas City Southern the tonnage raised in the territory of the San Antonio & Aransas Pass in exchange for the traffic raised in the territory of the Houston & Texas Central.

The Railway Commission of Canada has ordered a sweeping reduction of freight rates on the White Pass & Yukon and forbids discrimination against other companies in favor of the Atlas Mine Company. Before November 1 the road must file a tariff showing the rate heretofore charged and the new tariff giving carload rates of $1.75 per ton on ore and concentrates from Caribo to Skagway.

The Western Pacific and the Atchison, Topeka & Santa Fe have entered into a traffic agreement under which through rates will be made by them between points on the Western Pacific in Nevada and northern California and points on the Santa Fe in California, Arizona and New Mexico. This arrangement will bring into existence a new through north and south traffic route competitive with the Southern Pacific.

The Interstate Commerce Commission on Tuesday last suspended a number of tariff changing "tap line" rates, and will hold an investigation into the matter. The number of tariffs suspended and the roads affected are as follows:

Chicago & Alton, 1; Chicago & Eastern Illinois, 2; Chicago, Rock Island & Pacific, 5; Galveston, Harrisburg & San Antonio, 1; Illinois Central, 1; International & Great Northern, 3; Kansas City Southern, 3; Missouri, Kansas & Texas, 3; Missouri Pacific, 15; St. Louis & San Francisco 2; St. Louis Southwestern, 9.

The Boston & Maine has made considerable reductions in the rates on milk from points in Massachusetts to Boston. This announcement was made immediately after Mr. Mellen, of the New Haven road, became president of the B. & M. It appears that the rates were subjected to an important advance a few months since and the present change restores, or partly restores, the old rates. Mr. Mellen says that the rates now announced are unreasonably low, but he proposes to refer the whole question to the Massachusetts State Railroad Commission and then abide by the commission's decision.

According to the original agreement, the Kansas City Southern became a through line between Kansas City and Galveston for the transportation of freight interchanged with the Harriman lines. The agreement embraced interchangeable freight originating in Seaboard territory as well as points on and west of the Mississippi river. The earnings on this traffic alone, during the first year of operation, it was estimated, would amount to $1,000,000 gross.

The Illinois Manufacturers' Association has advised its members to put in claims for rebates on all shipments made over the western lines during the period following June 1, when the railways were charging their increased rates, which afterwards were withdrawn under the agreement made between the roads and the President of the United States. The order, which was afterwards made by the Interstate Commerce Commission, authorized the roads to refund these excess collections, reporting such payments to the commission.

Under the modified agreement the Houston & Texas Central, which contributed its share of the tonnage to the Kansas City Southern at Shreveport, La., has been released in order to afford the St. Louis & San Francisco system an outlet to the Gulf. In exchange for the tonnage thus diverted from the Kansas City Southern, all the tonnage raised in the San Antonio & Aransas Pass territory is to be turned over to the Kansas City Southern. In all other respects the traffic agreement of February 5, 1909, remains as originally drawn.

The Freight Rate Hearings in New York.

Our report of these hearings, published last week, concluded the principal features of the testimony, except that given by C. S. Wight, freight traffic manager of the Baltimore & Ohio. Mr. Wight said that before considering advances in rates, consultations were had with shippers. The announcements had not been followed by complaints from any of his shippers. Speaking of the cost of carrying freight, Mr. Wight said that the Trunk Line Association spent $200,000 yearly for the inspection of freight (to detect false classification). Asked why he did not prosecute shippers who thus tried to cheat the carrier, Mr. Wight said that it was not the duty of the railways to enforce the criminal statutes.

Mr. Thorne, attorney for the Corn Belt Meat Producers' Association, presented a protest against the admission of statistics and other evidence in such a way that the shippers did not have a chance to cross examine the men who were intimately acquainted with the evidence offered. To deny this privilege is a denial of "due process of law." Mr. Thorne asked the commission to institute an original investigation of the records of the railways, examining their officers and employees as to the alleged increase in operating expenses. One of the witnesses who could not be cross-examined was Mr. Thayer, of the Pennsylvania, who has been obliged to go to Europe because of ill health.

Other testimony will be taken at Washington, probably next month.

Shippers Representatives.

If the railways make full and candid disclosures of information as to the justice and reasonableness of the increased rates, on the other hand it behooved the shippers to exhibit a spirit of fairness and a desire to secure justice and no more. They are assuming to represent the interests of the public, but the interests of the public may not be altogether on the side of certain organizations of business men who may profit by low rates of transportation. Such organizations are apt to intrust the direction of their activities to officer and committees, or to counsel, who do not very distinctly represent the views of their membership. Those who appear against the railways are not actual shippers, but representatives of associations constituted of those more or less directly interested in the cost of transportation.—*Journal of Commerce*, New York.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF JULY, 1910.
(See also issue of September 9.)

Name of road.	Mileage operated; end of period.	Operating revenues			Operating expenses						Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama Great Southern	309	$215,857	$107,947	$353,362	$47,813	$89,073	$10,725	$108,893	$8,874	$265,378	$87,984	—$503	$11,522	$75,959	$16,166
Arizona Eastern	316	103,640	33,009	145,571	27,532	11,937	1,747	37,857	3,335	82,408	63,163	.....	4,719	58,444	15,699
Atlanta & West Point	92	38,130	40,680	86,394	11,847	16,284	4,660	26,062	4,116	62,969	23,425	164	4,409	19,180	2,712
Atlanta, Birmingham & Atlantic	662	143,551	56,915	212,910	24,387	36,950	13,181	81,025	8,560	164,103	48,807	.....	10,000	38,807	24,649
Balt. & Ohio—Chicago Terminal.*	90	.....	3,304	136,047	18,767	17,048	467	66,461	3,154	105,898	30 149	960	18,558	12,551	.....
Butte, Anaconda & Pacific	46	83,614	10,377	99,780	11,202	18,658	561	39,995	2,015	72,431	27,349	.....	2,500	24,849	3,304
Central New England	277	176,430	32,485	222,594	63,400	21,074	1,184	75,542	2,968	164,168	58,426	.....	9,000	49,426	—14,167
Central of Georgia	1,915	616,594	315,281	1,008,018	140,538	180,124	32,450	315,437	36,439	704,988	303,030	6,950	44,900	265,080	79,329
Central Vermont	411	153,190	99,530	274,328	44,157	40,268	7,615	112,587	6,903	211,530	62,798	1,200	10,116	53,882	—41,513
Chesapeake & Ohio	1,939	1,952,329	503,456	2,560,304	324,404	449,717	48,475	721,461	54,858	1,598,915	961,389	291	76,750	884,930	—17,913
Chesapeake & Ohio of Indiana.†	284	88,146	33,119	128,390	21,823	19,399	9,815	58,809	4,395	114,241	14.149	.....	3,790	10,359	.....
Chicago Great Western	1,487	614,018	257,522	951,436	112,468	145,323	47,891	377,488	34,460	717,630	233,806	—283	32,822	200,701	.....
Chicago, Indianapolis & Louisville	616	339,980	141,947	528,187	70,973	70,876	18,736	177,909	14,951	353,445	174,742	.....	22,500	152,242	—1,648
Chicago, Milwaukee & Puget Sound	1,521	1,001,106	118,347	1,142,071	37,094	122,898	25,974	377,289	9,499	572,754	569,317	3,353	37,833	534,836	.....
Chicago, Milwaukee & St. Paul	7,511	3,450,123	1,397,894	5,341,535	767,996	675,677	95,788	2,142,299	91,788	3,773,548	1,567,987	23,885	216,041	1,375,831	—86,094
Chicago, Peoria & St. Louis of Illinois	255	96,954	28,038	130,962	24,926	28,825	6,683	55,613	5,634	121,681	9,281	.....	4,500	4,781	—16,683
Chicago, Rock Island & Gulf	471	129,449	61,305	205,532	45,261	15,621	8,202	82,052	7,785	158,921	46,611	—296	8,593	37,722	—45,979
Cincinnati, Hamilton & Dayton	1,031	552,205	163,647	804,439	99,035	144,405	26,908	366,468	23,510	660,326	144,113	.....	26,890	117,223	—21,254
Cincinnati, New Orleans & Texas Pacific	337	567,868	136,540	743,153	79,186	110,574	20,526	223,468	17,140	450,894	292,260	—314	20,000	271,946	52,137
Colorado & Southern	1,248	556,341	192,773	790,037	136,326	153,912	13,728	257,065	21,642	582,673	207,364	—2,198	24,700	180,466	—14,884
Colorado Midland	337	93,181	43,855	157,345	26,877	34,460	5,649	64,545	5,597	137,128	20,217	384	8,500	12,101	—23,876
Cumberland & Pennsylvania	33	71,296	2,024	75,419	8,063	23,096	375	21,761	3,005	56,300	19,119	17	2,800	16,336	1,493
Denver & Rio Grande	2,553	1,420,914	537,730	2,049,725	268,432	286,223	53,359	621,785	49,288	1,279,087	770,638	3,137	70,000	703,775	—12,871
Detroit & Mackinac	360	63,747	35,077	105,296	12,200	13,544	2,126	32,635	2,533	63,038	42,258	671	8,624	34,305	6,158
Duluth, Missabe & Northern	293	1,936,228	43,407	1,989,082	97,977	108,466	1,496	227,364	11,405	446,708	1,542,374	12,988	80,236	1,475,126	.....
Fonda, Johnstown & Gloversville	84	19,558	71,580	95,746	8,528	3,466	1,987	22,900	5,511	42,892	53,354	2,621	3,333	52,642	4,388
Galveston, Harrisburg & San Antonio	1,338	491,154	229,287	762,197	129,465	128,030	29,638	299,127	28,848	615,108	147,089	—4,877	29,200	113,512	—32,715
Georgia	307	128,873	76,150	218,542	41,456	41,461	9,996	92,514	6,411	191,838	26,704	.....	2,188	24,521	77
Gulf & Ship Island	307	105,275	36,191	151,726	32,431	25,697	2,324	46,420	8,566	115,488	36,288	.....	4,951	31,337	—2,974
Idaho & Washington Northern	102	58,792	24,924	85,229	9,242	8,984	2,206	23,867	2,309	46,608	38,621	.....	3,000	35,621	12,628
Indiana Harbor Belt	106	.....	.....	172,208	42,709	24,331	2,526	39,285	5,825	164,676	7,532	1,816	5,500	3,848	—14,638
Kansas City Southern	827	612,717	142,326	887,977	88,493	114,229	23,985	287,110	27,229	541,046	296,931	.....	29,476	267,455	106,024
Lehigh & Hudson River	96	91,180	3,985	96,672	17,170	13,378	1,279	34,195	3,581	69,603	27,069	.....	3,100	23,969	2,030
Lehigh & New England	170	84,171	1,310	86,860	10,084	8,755	964	20,492	2,955	43,250	43,610	.....	1,500	42,110	16,362
Louisiana & Arkansas	255	92,982	15,818	113,377	20,546	15,445	2,472	28,708	4,210	71,381	41,996	.....	2,600	39,396	1,193
Louisiana Western	207	85,968	52,065	145,861	14,540	30,193	5,745	44,396	7,036	101,910	43,951	493	6,077	38,367	—13,937
Missouri & North Arkansts	365	44,027	27,679	76,209	24,272	12,841	1,979	30,729	2,952	72,778	3,436	.....	4,250	—814	—11,780
Missouri, Kansas & Texas Ry.‡	1,724	866,474	392,444	1,347,229	216,069	282,113	38,443	492,089	44,897	1,018,111	329,118	487	72,600	256,955	.....
Mobile & Ohio	1,114	600,800	118,844	837,180	110,188	158,499	38,156	311,507	32,544	645,894	191,286	—2,207	23,660	165,419	—54,766
Monongahela	65	106,814	3,275	111,453	38,819	8,859	284	25,537	1,965	75,414	36,039	.....	2,065	33,974	—26,197
Morgan's L. & Tex. R.R. & S.S. Co.	348	210,710	97,076	327,619	50,894	54,896	9,991	126,558	14,184	256,523	71,096	—1,456	17,756	51,884	—2,855
Nashville, Chattanooga & St. Louis	1,230	628,610	247,160	929,663	127,478	176,745	33,751	346,184	25,205	709,363	220,300	74	22,287	198,087	—2,826
Northwestern Pacific	376	123,105	235,989	381,438	43,193	36,382	3,269	105,110	9,066	197,020	184,417	.....	10,500	173,917	25,883
Oregon & Washington	192	74,413	80,496	163,038	16,089	4,119	9,050	59,104	3,746	92,108	70,930	—184	3,300	67,446	66,617
Oregon R.R. & Nav. Co.	1,491	810,338	406,231	1,290,484	203,772	129,918	23,227	424,488	32,385	813,740	476,744	5,032	57,430	424,346	—195,830
Oregon Short Line	1,595	1,188,776	524,635	1,803,731	310,234	163,328	14,446	393,614	39,464	921,086	882,645	1,352	61,991	822,006	—176,028
Pecos & Northern Texas	225	95,973	26,970	129,101	22,424	16,632	2,117	39,095	4,458	84,726	44,375	.....	2,450	41,925	—14,306
Pittsburgh, Shawmut & Northern	240	96,323	10,027	107,687	24,553	27,458	994	37,029	5,136	95,169	12,468	.....	1,578	10,890	—5,758
Richmond, Fredericksburg & Potomac	83	118,545	53,386	193,452	30,061	18,717	2,721	63,602	5,200	120,301	73,151	.....	200	72,951	3,036
St. Joseph & Grand Island	319	87,500	41,874	140,504	32,855	18,903	6,044	63,644	5,627	127,073	13,431	19	5,388	8,062	—29,674
St. Louis & San Francisco	4,732	2,016,480	962,863	3,195,735	460,417	442,011	83,758	1,156,361	100,043	2,242,590	953,145	.....	112,585	840,560	—72,681
St. Louis, Brownsville & Mexico	494	72,855	43,286	126,318	38,185	15,055	2,127	54,713	7,699	117,779	8,539	.....	4,000	4,539	—10,134
St. Louis Merchants' Bridge Terminal	9	.....	5,725	150,705	26,632	10,486	390	61,472	4,765	103,745	46,960	.....	5,038	41,922	8,634
St. Louis Southwestern of Texas	703	244,571	91,131	356,494	110,792	58,177	9,241	155,495	15,492	349,197	7,296	—173	8,333	—1,209	—1,965
San Pedro, Los Angeles & Salt Lake	1,105	326,284	265,299	626,820	176,132	86,061	26,427	201,844	16,490	506,954	119,866	—3,264	24,605	91,997	—182,040
Santa Fe, Prescott & Phoenix	364	90,486	39,881	143,014	26,285	11,489	2,928	44,005	5,081	89,788	53,226	.....	100	53,126	—2,848
Southern Indiana	236	128,512	19,655	149,759	19,070	31,138	1,770	42,844	5,702	100,525	49,234	—144	6,928	42,162	5,975
Southern Kansas of Texas	125	75,990	18,530	98,693	17,603	18,949	2,126	36,368	4,368	79,414	19,279	.....	2,487	16,792	—23,178
Southern Pacific Co.	6,147	4,426,825	3,142,710	8,116,575	947,957	989,695	171,170	2,066,248	209,828	4,384,899	3,731,676	16,263	275,053	3,472,886	—115,777
Spokane International	141	62,896	23,083	90,597	19,270	5,006	2,058	24,768	3,198	54,300	36,297	.....	3,585	32,712	2,146
Staten Island Rapid Transit	11	52,727	32,316	90,048	11,413	5,196	488	25,087	3,317	45,501	44,547	7,252	3,250	48,549	7,862
Sunset	56	66,707	17,994	87,726	7,960	1,478	32	15,880	945	26,295	61,431	.....	267	61,164	32,006
Syracuse, Binghamton & New York	81	44,682	34,190	90,321	9,880	5,360	3,406	28,832	2,456	49,934	40,387	.....	5,500	34,887	—5,143
Terminal R.R. Ass'n of St. Louis	34	.....	272	198,399	24,779	16,345	614	76,404	4,167	122,309	76,090	16,737	21,500	71,327	—20,119
Texas & New Orleans	458	201,889	88,667	308,227	52,320	54,573	8,169	109,338	9,175	233,575	74,652	27	12,182	62,497	145
Toledo, Peoria & Western	248	49,648	39,150	93,902	19,927	18,259	2,038	36,617	3,163	80,004	13,898	.....	5,000	8,898	—3,313
Union Pacific	3,411	3,199,752	1,108,537	4,632,389	574,817	504,914	110,908	1,061,922	98,642	2,351,203	2,281,186	3,956	144,500	2,140,642	—59,505
Union R.R. of Baltimore	9	111,207	19,418	131,862	10,794	.....	664	5,403	1,973	18,834	113,028	.....	5,002	108,026	18,755
Union R.R. of Pennsylvania	31	.....	.....	386,285	37,443	63,072	24	137,451	2,514	240,504	145,781	3,407	2,770	146,418	—90,988
Washington Southern	35	40,797	27,231	90,851	7,547	7,461	1,245	33,681	1,969	51,903	38,948	.....	2,345	36,603	—1,642
Western Ry. of Alabama	133	42,227	34,902	84,097	16,073	16,776	4,950	25,485	5,162	68,447	15,650	—236	3,891	11,523	1,201
Wheeling & Lake Erie	457	531,602	61,706	630,796	79,933	95,503	10,306	205,255	13,553	404,550	226,246	6,178	21,308	211,116	28,752

*Began operations on April 1, 1910; succeeding Chicago Terminal Transfer Ry. † Began operations on July 1, 1910, succeeding Chicago, Cincinnati & Louisville Ry. ‡ Beginning with July 1, 1910, operations of Missouri, Kansas & Texas (parent company) and Missouri, Kansas & Texas of Texas reported separately. — Indicates Deficits, Losses and Decreases.

Hearings on Western Freight Rate Advances.

The hearings being held by the Interstate Commerce Commission for the purpose of determining the reasonableness of the advances in freight rates which the western railways are seeking to make were resumed at Chicago on September 19. Commissioners Clements, Lane and Clark presided. That the commissioners themselves took charge of the case, instead of leaving it in the hands of examiners, as had been previously done, was gratifying to both the shippers and the railway men. It had been felt by both sides that the proceedings were so important that no one was competent to guide them except members of the commission.

The first testimony introduced on the ersumption of the hearings was that of the Illinois Central. M. P. Blauvelt, its comptroller, testified that if its operating expenses in the fiscal year 1910 had averaged as high as they are running now and the same traffic conditions had existed the road, after paying its fixed charges and regular dividends, would have had a deficit of more than $1,000,000. The total investment in the property has been $277,311,324, and its capitalization is $285,000,000. The return on the actual investment in 1910 was but 4.6 per cent. In 1907 the road had a surplus of $5,000,000. This had been reduced at the end of the fiscal year 1910 to $233,928. In response to questions by counsel for the shippers, Mr. Blauvelt admitted that some of the increases in expenses of the road had been due to "grafting" in the repairs of its cars, the total losses on account of these frauds during the past two or three years having been between $1,000,000 and $1,500,000, of which between $600,000 and $700,000 occurred during the fiscal year 1910. He stated that $300,000 of the money out of which the road had thus been defrauded had been recovered, otherwise it would have had no surplus at the end of the fiscal year.

He said that the net operating income of the road increased with comparative regularity from 1890 to 1907, when it was $16,545,108. In 1908 it was $13,417,000, in 1909 it was $15,464,230 and in 1910 it was $12,787,921, a decrease of nearly $4,000,000, as compared with 1907. C. M. Kittle, statistician of the operating department, testified that payments for injuries to persons and damages to freight were 540 per cent. larger in the last ten years than they were in the previous ten years. He referred to various increases in expense that had been caused by government regulation of safety appliances, hours of labor, etc.

One of the attorneys for the shippers, Clifford Thorne, is making a race for the position of railway commissioner of Iowa by aiding in the trial of these rate cases. In connection with the testimony regarding the increases of loss and damage claims, Mr. Thorne asked if the witness had any record of the amount of rebates paid prior to 1904 which might throw light on the question of whether the cessation of rebates had any effect on the increase in the claims. T. J. Norton, general attorney for the Santa Fe, asked: "Are we to understand that Mr. Thorne intends to make a refund of the rebates received illegally by his clients and that that is the reason why he wants this information? His clients should come into the court with clean hands before asking such questions."

Counsel for the Western Live Stock Association and the Illinois Manufacturers' Association filed statements with the commission giving long lists of facts which they desired the commission to require the railways to present. Attorney S. H. Cowan, representing the Western Live Stock Association, said that the question of what are reasonable earnings for a railway cannot be ascertained without having the value of the properties officially ascertained by the commission. He asserted that the annual reports of the roads do not fairly represent the amount of profits they are making. Among data the commission was asked to require are statistics showing the cost of the properties, amount of earnings invested in them, the way that all their capital stock and bonds have been issued, the amount received for them, etc.; in other words, the shippers desire the roads to be required to show the relation between the capitalization of the properties, the original investment in them and their physical value.

W. L. Clark, vice-president and general manager of the Illinois Central, testified regarding the need for American railways in general and the Illinois Central specifically to make great improvements in their facilities in order to give the public both good and safe transportation. He referred to the comparatively small mileage of railways that are equipped with block signals, and especially with automatic signals, and said that a great increase in the mileage of signals is necessary in order to reduce accidents. He declared that about 80 per cent. of accidents are due to the human element—to mistakes and carelessness of employees. In order to reduce the number of accidents due to the human element, it is necessary, among other things, for the roads to provide good places for their employees to spend their time at the end of their runs, so that they may get rest and recreation in comfortable circumstances. Mr. Park also referred to the constant demands of the public for better railway stations, for new branch lines, etc., and to the increasing need for railways to build second track, sidings, etc., in order to handle the traffic. All these things increase the fixed charges which the railways must meet, and unless they can earn enough not only to pay their operating expenses, fixed charges and dividends, but to have a comfortable margin of earnings to spend on the properties and to put aside as surplus, they are unable to raise the capital necessary to make the required improvements. He said that the Illinois Central now has demands from communities along its lines for at least 100 new freight and passenger stations, and unless it is able to earn more money it will not be able to meet demands such as these, most of which are perfectly reasonable. The railways, he said, are not indisposed to provide the public with the improved facilities that it demands, if the public will only let them earn enough money to provide them.

Rock Island Lines Adopt Bill of Lading Signature Certificate.

The Rock Island lines have adopted the bill of lading signature certificate, the use of which has been recommended by the American Bankers' Association, in connection with export and domestic cotton bills of lading. The signature is in the following form and must be attached to order bills of lading issued by Rock Island agents covering cotton destined to all points beyond the Rock Island lines' rails:

(Form 118 Uniform.)

Bill of Lading Signature Certificate No. .....

THE CHICAGO, ROCK ISLAND & PACIFIC RAILWAY COMPANY hereby certifies

THAT.....is its regularly appointed.....
Agent at.....and as such is authorized to sign Bills of Lading in accordance with the regulations of this Company, and that the signature on the attached order notify bill of lading No....., dated.....covering.....Bales of Cotton
(Place of issue) (Date)
marked.....
is his signature.

.....
.....
(Date.)

The certificates will be issued in book form with original, duplicate and stub and numbered consecutively, and will be charged out to the agents in the same manner as passenger tickets, and a check will be made of these documents the same as of passenger tickets.

The original certificate must be signed by some official or employee who is personally acquainted with the agent issuing the bill of lading and familiar with his signature, and when signed must be attached to the bill of lading with mucilage or paste.

INTERSTATE COMMERCE COMMISSION.

Another Case of Discrimination in Distribution of Coal Cars.

W. F. Jacoby and Isaac C. Weber, trading as W. F. Jacoby & Co., v. Pennsylvania Railroad. Clark Brothers Mining Co. v. same. Opinion by Commissioner Harlan.

The substantial points on which discrimination is claimed are as follows: The mine of the defendant, known as Falcon No. 2, has substantially the same capacity as the mine known as Eureka No. 27 of the Berwind-White Coal Mining Co. During 1902, 1903 and 1904 the defendant gave orders to make the Berwind-White Coal Mining Co. a special allotment of 500 coal cars daily. That company had contracts for supplying coal for certain steamships sailing from New York. Complaint had been made that these steamers were frequently delayed because of lack of coal, and the defendant felt that it was warranted in making that special arrangement with the coal mines that had undertaken to supply them with fuel. We see no grounds on which such discrimination can be justified by the commission. It must be condemned in strong terms as an undue preference. During 1906 and 1907 the Berwind-White mines were daily in receipt of coal cars in large numbers and were therefore kept

in operation almost continuously, while the complainants received an inadequate supply of cars and were not able, therefore, to run their mine to the best advantage. This difference is largely explained by the fact that the Berwind-White company owned a large number of private cars. Under the rules of the defendant, as explained in Hillsdale Coal & Coke Co. v. Pennsylvania Railroad, the ownership of these private cars resulted in a special allotment to the mines of that company. This is held to be a discrimination against complainant but as in the Hillsdale case, the question of reparation will be considered later. (19 I. C. C., 386.)

STATE COMMISSIONS.

The Wisconsin Railroad Commission has ordered the Northern Pacific to reduce its rate for switching cars from the Minneapolis, St. Paul & Sault Ste. Marie to the western part of the city at Superior, Wis., from $3 to $1.50 per car.

Because the Indiana Railroad Commission has been put to considerable expense during the year in employing attorneys to defend the commission against the unusual number of actions by railways, William J. Woods, chairman, and J. F. McClure, member of the commission, both of whom are attorneys, will appear and defend a number of the minor suits, the hearing of which will be had soon.

The New York State Public Service Commission, Second district, has appointed Walter I. Sweet, of Port Richmond, New York City, to be assistant chief of the division of telephones and telegraphs, at a salary of $3,000. Mr. Sweet will be in charge of the office of the Second District Commission in New York City. He has had extensive experience in telegraph and railway service and has, for several years, been with the New York & New Jersey Telephone Company.

The Nebraska Railway Commission has granted the petition of the Union Stock Yards of South Omaha that they be allowed to increase their switching charges. Estimates of the stock yards company and of the railway commission regarding the value of the switching property used by the stock yards differed widely, and the commission decided in fixing the rates not to take into consideration the value of the stock yards company's property, but to allow it to increase its rates on the ground that the rates it proposed to charge were reasonable and just for the services performed.

COURT NEWS.

The state of Texas has sued the Pecos & Northern Texas for a penalty of $10,000 for failing to obtain the approval of the State Railroad Commission to the plans of a new station at Canyon City. Plans were submitted and rejected and then the company went ahead and put up its building according to plans which had not been approved.

Railway Developments in South Africa.

The American Consul-General in South Africa is quoted as saying that one of the most striking indications of the healthy and prosperous condition of the country is the increase in railway receipts, and even more the demand for rolling stock and equipment, which has necessitated the immediate placing of orders amounting to $3,500,000. Besides the branch lines now under construction in the Transvaal, Natal and Cape Colony, and other extensions in all these colonies sanctioned by the British government, the Cape-to-Cairo road probably will be completed by August, 1911, as far north as the Star of the Congo mine, across the Belgian frontier, to tap the rich copper deposits in the Tanganyika district, which will produce, it is stated, from 60,000 to 90,000 tons of copper annually. If these expectations are fulfilled, it is the intention to build a railway within the next few years from this copper district to the West Coast at Lobito bay, thus materially reducing the present long journey to England via Cape Town by steamer and railway from Northern Rhodesia and Katanga.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

G. W. Martin, vice-president and general manager of the Pittsburgh & Susquehanna Valley, at Philipsburg, Pa., has resigned to go to another company.

Charles G. Stamm, assistant auditor of freight accounts of the Cleveland, Cincinnati, Chicago & St. Louis, the Cincinnati Northern and the Peoria & Eastern, with office at Cincinnati, Ohio, has resigned to engage in other business.

C. H. Naylor, for many years connected with the auditing department of the International & Great Northern, has been appointed auditor of the Beaumont & Great Northern, with office at Onalaska, Tex., succeeding E. S. Kane, resigned to engage in other business.

Operating Officers.

J. W. Dean, general superintendent of the Colorado lines of the Denver & Rio Grande, with office at Pueblo, Colo., has resigned.

R. F. Carr has been appointed inspector of train and station service of the St. Louis & San Francisco, with office at Springfield, Mo.

A. D. Chittenden has been appointed assistant to the general manager of the Bessemer & Lake Erie, with office at Pittsburgh, Pa.

M. A. Powers has been appointed general manager of the Pittsburgh & Susquehanna Valley, succeeding to the duties as general manager of G. W. Martin, vice-president and general manager, resigned.

O. Cornelisen, formerly general superintendent of the Chicago Great Western at Chicago, has been appointed superintendent of the Kansas City Southern, with office at Pittsburg, Kan., succeeding F. B. De Garmo, resigned.

T. A. Dempsey, superintendent of dining cars of the Denver & Rio Grande at Denver, Colo., has been appointed superintendent of dining service of the Missouri, Kansas & Texas, with office at St. Louis, Mo., succeeding F. E. Miller, resigned.

L. B. Allen, general superintendent of the Chicago, Burlington & Quincy at Burlington, Iowa, has been appointed general superintendent of the Nebraska district, with office at Lincoln, Neb., succeeding W. B. Throop, assigned to other duties. F. L. Johnson, division superintendent at Chicago, has been appointed general superintendent, succeeding Mr. Allen. N. H. Young, superintendent of terminals at St. Louis, Mo., succeeds Mr. Johnson and B. B. Greer succeeds Mr. Young.

R. J. Parker, general superintendent of the western lines of the Atchison, Topeka & Santa Fe at La Junta, Colo., has been appointed general superintendent of the Eastern district, eastern lines, with office at Topeka, Kan., succeeding F. C. Cox, promoted. J. M. Kurn, superintendent of the New Mexico division at Las Vegas, N. Mex., succeeds Mr. Parker. F. L. Myers, superintendent of the Rio Grande division at San Marcial, N. Mex., succeeds Mr. Kurn, and Frank E. Summers, trainmaster on the Missouri division at Marceline, Mo., succeeds Mr. Myers.

George F. Malone, who has been appointed superintendent of car service of the Baltimore & Ohio, with office at Baltimore, Md., was born October 13, 1868, at Shelby, Ohio. He began railway work in October, 1889, as a clerk in the car service department of the Cleveland, Lorraine & Wheeling, now a part of the Baltimore & Ohio, and was later car tracer and then car service agent on the same road. In December, 1901, he was appointed chief clerk in the car service department of the Baltimore & Ohio, and since 1902 he has been assistant superintendent of car service of the Baltimore & Ohio system.

Milton Benjamin Bayer, whose appointment as superintendent of the Oregon & Washington, with office at Tacoma, Wash., has been announced in these columns, was born February 15, 1880, at Kendall, N. Y. He attended the public schools, and

began railway work with the New York Central in 1897 as an operator on the Oswego district. Later he was operator and despatcher on the Watertown district, and from December, 1901, to April, 1906, he was despatcher and assistant chief despatcher on the Delaware, Lackawanna & Western at Buffalo, N. Y. He then went to the Northern Pacific first as despatcher and later as chief despatcher at Tacoma, Wash., and in April of the present year he was made supervisor of transportation of the Oregon & Washington at Tacoma, from which position he was recently promoted to superintendent of the same road. The position of supervisor of transportation has been abolished.

James R. Kearney, who has been appointed superintendent of transportation of the Baltimore & Ohio, at Baltimore, Md., was born March 29, 1859. He was educated in the common schools at Altoona, Pa., and began railway work in 1876 as a messenger boy in the car service department of the Pennsylvania Railroad. He was later a clerk in the car record office of the same company at Altoona, and from March, 1880, to May of the following year held a similar position with the Illinois Central. He was then for six months car accountant of the Illinois Midland, now a part of the Vandalia, and then returned to the Illinois Central, remaining as clerk in the car record office of that company until May, 1882, when he went to the St. Paul, Minneapolis & Manitoba, holding successively the positions of clerk and chief clerk in the car record office of that company and its successor, the Great Northern. He entered the service of the Baltimore & Ohio in 1899, and in 1901 was appointed superintendent of car service, which position he held at the time of his recent appointment.

Frederick Conrad Fox, whose appointment as general manager of the western lines of the Atchison, Topeka & Santa Fe, with office at Amarillo, Tex., has been announced in these columns, was born October 9, 1863, at Marysville, Ohio. He received his education in the public schools and began railway work in August, 1880, with the Atchison, Topeka & Santa Fe as an operator. In 1884 he was made relief agent on the New Mexico and Rio Grande divisions, and for four years from December, 1885, acted as agent at various stations. He was then appointed a chief despatcher on the Rio Grande division, and from 1892 to 1897 was trainmaster on the same division. He was then transferred to the New Mexico division and was promoted to superintendent of the Western division in 1900. For two years from January, 1901, he was superintendent of the New Mexico and Rio Grande divisions, when he was transferred to the Middle division. In April, 1905, he was promoted to general superintendent of the Western grand division, and a few months later was transferred, with the same title, to the Eastern grand division, which position he has held to date. His recent appointment as general manager of the western lines becomes effective October 1.

Frederick C. Fox.

The following rearrangement of territory of the superintendents of the Missouri, Kansas & Texas has been announced: A. E. Boughner, superintendent at New Franklin, Mo., will have jurisdiction over the St. Louis, Boonville and Hannibal divisions and Columbia branch, with office at Sedalia, Mo.; J. L. Walsh, superintendent at Parsons, Kan., will have jurisdiction over the Sedalia, Kansas City and Parsons divisions and over the Iola and Eldora Springs branches, with office at Parsons; N. J. Finney, superintendent at Sedalia, will have jurisdiction over the Cherokee, Neosha and Joplin divisions, with office at Parsons; W. E. Williams, superintendent at Denison, Tex., will have jurisdiction over the Muskogee, Choctaw, Tulsa and Wilburton divisions and Coalgate branch, with office at McAlester, Okla., and W. E. Brown, superintendent at Oklahoma City, Okla., will have jurisdiction over the Shawnee, Oklahoma, Osage and Guthrie divisions, with office at Oklahoma City. J. M. Gayle has been appointed assistant superintendent, with office at Sedalia, Mo.; K. A. Easley, trainmaster at Parsons, Kan., has been appointed an assistant superintendent under Mr. Walsh, and W. Wackher an assistant superintendent under Mr. Finney, both with offices at Parsons; R. L. Gardner, trainmaster at Dennison, Tex., has been appointed an assistant superintendent, with office at McAlester, Okla., and T. F. Gardner has been appointed an assistant superintendent, with office at Oklahoma City, Okla. The office of trainmaster has been abolished at Parsons and at McAlester.

Charles W. Galloway, general superintendent of transportation of the entire Baltimore & Ohio system at Baltimore, Md., has been appointed general superintendent of the Baltimore & Ohio Southwestern, with office at Cincinnati, O., succeeding W. H. Brimson, resigned. James R. Kearney, superintendent of car service, at Baltimore, Md., succeeds Mr. Galloway as superintendent of transportation, and George F. Malone, assistant superintendent of car service, succeeds Mr. Kearney.

Charles W. Galloway, who has been appointed general superintendent of the Baltimore & Ohio Southwestern, with office at Cincinnati, Ohio, succeeding W. H. Brimson, resigned, was born December 11, 1868. Mr. Galloway entered the service of the Baltimore & Ohio in April, 1883, as a messenger boy in the operating department in Baltimore, and since that time has been in the continuous service of that company. He studied telegraphy and stenography, and from a clerkship was appointed private secretary to the late Thomas Fitzgerald, in April, 1891, which position he filled for six years. In September, 1897, he was made trainmaster of the Baltimore division, becoming assistant superintendent at Cumberland, Md., in April, 1898. He was appointed superintendent of the Cumberland division in July, 1899, where he remained until November, 1901, when he was transferred to Baltimore in a similar capacity. He was appointed superintendent of transportation of the entire Baltimore & Ohio system December 20, 1906, and advanced to general superintendent of transportation July 1, of this year, which position he held at the time of his recent appointment.

C. W. Galloway.

Traffic Officers.

E. M. Marens has been appointed a contracting freight agent of the Atlanta, Birmingham & Atlantic, with office at Kansas City, Mo.

G. F. Diekroeger, contracting agent of the Canadian Pacific Despatch, has been appointed westbound agent, with office at St. Louis, Mo.

J. T. Buckner, commercial agent of the Missouri, Oklahoma & Gulf, with office at Denison, Tex., has resigned to engage in other business.

O. A. Toole has been appointed a commercial agent of the Macon & Birmingham, with office at Macon, Ga., succeeding J. G. North, resigned.

Peter Palmateer, assistant passenger agent of the Atchison, Topeka & Santa Fe at Buffalo, N. Y., has been appointed pas-

senger agent, with office at Buffalo, succeeding Charles A. Marsh, deceased.

J. W. Glover has been appointed a traveling freight agent of the Pittsburgh & Lake Erie, with office at Brownsville, Pa., succeeding G. R. Williams, resigned.

H. W. Cunningham has been appointed a commercial agent of the Chicago Great Western, with office at Kansas City, Mo., succeeding J. H. Dengel, resigned.

Robert F. Hyde, assistant claim agent of the Trinity & Brazos Valley at Teague, Tex., has been appointed claim agent of the Houston Belt & Terminal, with office at Houston, Tex. E. D. Staggs succeeds Mr. Hyde.

D. M. Davis, city passenger agent of the Chicago & North Western at Des Moines, Iowa, has been appointed a traveling agent, with office at Sioux City, Iowa, succeeding E. H. Lowderbaugh, resigned to engage in other business.

D. L. Hyde, joint agent of the Illinois Central and the South Dakota Central at Sioux Falls, S. D., has been appointed contracting freight agent of the Illinois Central, with office at St. Louis, Mo., succeeding A. L. Masso, resigned.

C. B. F. Lincoln has been appointed passenger and freight agent of the San Pedro, Los Angeles & Salt Lake, with office at Ocean Park, Cal. J. L. Moore has been appointed city passenger and freight agent, with office at Santa Ana, Cal.

J. L. Kenealy, traveling freight agent of the Buffalo & Susquehanna, at Wellsville, N. Y., has been appointed a soliciting agent, with office at Buffalo, succeeding I. I. Van Allen, transferred to the operating department. R. E. Ball succeeds Mr. Kenealy, with office at Wellsville.

A. A. Burke and E. G. Ranney have been appointed traveling passenger agents of the Canadian Pacific, both with offices at Boston, Mass., succeeding W. H. Snell and James Burdon, transferred. Thomas McNeil has been appointed agent at Antwerp, Belgium, succeeding S. E. Cruse.

T. W. Wuerpel has been appointed a commercial agent of the St. Louis & San Francisco, the Chicago & Eastern Illinois and the Evansville & Terre Haute, with office at Monterey, Mexico. B. B. Wise has been appointed a traveling freight and passenger agent, with office at Mexico City.

J. W. Gantz, commercial agent of the St. Louis & San Francisco and the Chicago & Eastern Illinois at St. Louis, Mo., has been appointed general agent in the freight department, with office at St. Louis, succeeding A. D. Murray, resigned to engage in private business. F. J. Lawler, soliciting freight agent, succeeds Mr. Gantz.

C. A. Florence, general eastern freight agent of the Illinois Central at New York, has been appointed assistant general freight agent in charge of import and export traffic, with office at Chicago. L. F. Klein, commercial agent of the Missouri Pacific at Philadelphia, Pa., succeeds Mr. Florence, with office at New York, effective October 15.

Gabe Filleul, western passenger agent of the National Railways of Mexico at Chicago, has been appointed general agent, with office at New Orleans, La. Incident to the appointment of Frank L. Moe as general western agent at Chicago it should have been mentioned that he will have charge of both the passenger and freight departments at Chicago.

Robert Kerr, passenger traffic manager of the Canadian Pacific, at Montreal, Quebec, having reached the age limit, will be retired on October 1, as previously announced in these columns. Mr. Kerr was born in August, 1845, at Toronto, Ont., and began railway work in 1866 as warehouse clerk, and later held various positions with the Northern Railway of Canada. In 1879 he was appointed through freight agent of the same road. From 1879 to 1884 he was general freight and passenger agent of the Northern & Northwestern, now a part of the Grand Trunk. In June, 1884, he went to the Canadian Pacific as general freight and passenger agent of the Western and Pacific divisions at Winnipeg, Man., remaining in that position until January, 1896, when he was appointed traffic manager of the lines west of Lake Superior, and since June, 1899, he has been passenger traffic manager of all lines on the same road.

Engineering and Rolling Stock Officers.

George Beckingham, roadmaster of the Grand Trunk at Montreal, Que., has been appointed general roadmaster of the Eastern division, with office at Montreal, succeeding David McCooe, promoted.

C. D. Swingly, division engineer of the Connellsville division of the Baltimore & Ohio at Connellsville, Pa., has been appointed division engineer of the Pittsburgh division, with office at Pittsburgh, succeeding L. P. Rossiter, resigned. Phillip Petri, division engineer of the Ohio division at Parkersburg, W. Va., succeeds Mr. Swingly, and G. T. Warren, division engineer of the Shenandoah division at Winchester, Va., succeeds Mr. Petri. E. T. Brown, division engineer of the Philadelphia division at Philadelphia, succeeds Mr. Warren, and J. Tordello, assistant division engineer of the Cumberland division at Cumberland, Md., has been appointed assistant division engineer of the Pittsburgh division at Pittsburgh, succeeding C. Johnston, resigned.

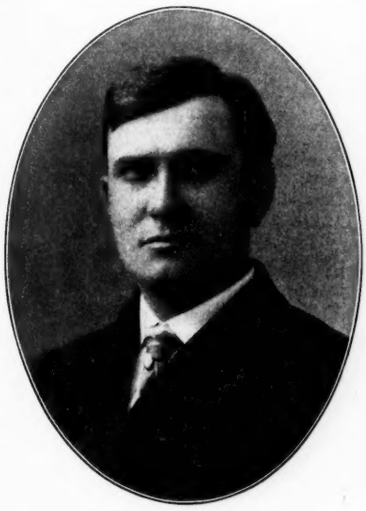
Purchasing Officers.

F. A. Bushnell, purchasing agent of the Spokane, Portland & Seattle and the Astoria & Columbia River, at Portland, Ore., has been appointed purchasing agent of the Oregon Trunk, the Oregon Electric and the United Railways Co., and storekeepers will report to him at Portland.

OBITUARY.

F. M. Darrah, commercial agent of the Rock Island Lines at Atchison, Kan., died at Atchison on September 17.

Geather Jackson De Vilbiss, superintendent of motive power of the Hocking Valley at Columbus, Ohio, a brief mention of whose death in the accident caused by the derailment of a northbound passenger train on the Hocking Valley September 12, was made in these columns, was born July 31, 1875, at St. Joe, Ind. Mr. De Vilbiss attended the common schools and later studied mechanics through a correspondence school. He began railway work in 1889 as an apprentice on the Wabash Railroad and was later made roundhouse foreman on the same road at Peru, Ind. He then went to the Grand Trunk as general foreman of the Battle Creek shops, but was compelled to resign this position on account of ill health. His next position was roundhouse foreman of the Chicago, Rock Island & Pacific, which he resigned in 1904 to go to the Baltimore & Ohio as a master mechanic. In 1907 he was appointed superintendent of motive power of the Hocking Valley, which position he held at the time of his death.



G. J. De Vilbiss.

The Russian authorities have increased the capacity of their freight car stock simply by issuing a decree. It has been found, this decree says, that the present cars, hitherto limited to loads of 750 poods, are capable of carrying and may be loaded with 900 poods. This latter weight is almost exactly 32,500 pounds. In the lates 70s and the 80s in this country, it is said, some companies thus increased the capacity of cars by a paint brush, marking 30,000 lbs. instead of 20,000. In 1880 Russian freight cars were changed from 610 poods capacity to 750, but then, in many cases at least, stronger springs were added.

Railway Construction.

New Incorporations, Surveys, Etc.

Atchison, Topeka & Santa Fe.—It is announced that the Pecos & Northern Texas, building a branch from a point on the Coleman-Lubbock line near Lubbock, Tex., southwest to La Mesa, 55 miles, and the 16-mile section of the Coleman cut-off, from Lubbock to a connection with the La Mesa branch, is to be opened for operation on October 1.

Baltimore & Ohio.—An officer writes that this company recently bought a plot of ground in order to carry out the grade elimination work in South Baltimore, Md. (Aug. 19, p. 332.)

Bowdon Railway.—An officer writes that a contract has been given to J. W. Wright, Jr., Union Springs, Ala., to build from Bowdon, Ga., northeast to Harmony, on the Central of Georgia, 12 miles. It is expected that the line will be finished in about 60 days. J. L. Lovvorn, president; J. M. Terrell, vice-president; A. E. Fleming, secretary and treasurer, and H. P. Harris, chief engineer. Bowdon.

Chicago & North Western.—This company on July 31, 1910, had under construction 354 miles of new lines, including the following:

Bellefourche Valley, from Bellefourche, S. Dak., to Newell, 23 miles.

Doland & Southeastern, from Doland, S. Dak., to Iroquois, 40 miles.

James River Valley & Northwestern, from Gettysburg. S. Dak., to Blunt, 43 miles; Onida to Hitchcock, 55 miles.

Milwaukee, Sparta & Northwestern, from near Milwaukee, Wis., to Clyman, with connecting lines, a total of about 52 miles; Clyman to Necedah, 89 miles; Wyeville to Sparta, 23 miles.

Sioux City, Dakota & Northwestern, from Hinton, Iowa, to Hawarden, 23 miles.

Columbia & Montour.—This company is said to be planning to build an extension from Berwick, Pa., northeast to Wilkesbarre, about 35 miles. The company has under consideration the question of building other extensions.

Crystal City & Uvalde.—An officer of this company, which now operates 53 miles of line from Uvalde Junction, Tex., to Carrizo Springs, is quoted as saying that an east and west line will be built from Crystal City west to Eagle Pass, 40 miles, and from Crystal City east to Aransas Pass, about 225 miles, if the required bonuses of $250,000, for the Eagle Pass line, and $200,000, for the extension to Aransas Pass, are raised by the land owners and people along the route of the proposed extensions. It is thought that the amounts will be raised and contracts signed for the construction of the extensions soon.

Delaware, Lackawanna & Western.—It is expected that track laying will be started soon on sections of the new cut-off being built by the Lackawanna Railroad Co. of New Jersey between Slateford, Pa., and Port Morris, N. J., 28 miles. The line will not have any grade crossings, and it is expected that the work will be finished in about one year. (Apr. 8, p. 969.)

Denver, Northwestern & Pacific.—See an item in General News regarding this road.

Fort Wayne & Toledo (Electric).—An officer writes that the company has secured franchises through the various towns and obtained most of the right-of-way from Fort Wayne, Ind., northeast via Maysville to Hicksville, Ohio, thence via Farmer to Bryan, 45 miles, with a spur line north to Montpelier, 10 miles. The company expects to finish the first 15 miles from Fort Wayne to Harlan this fall. Work is now under way putting up a number of bridges. Five of the bridges have already been finished, as well as a 500-ft. trestle near Bryan. R. T. Bastress, general manager, Harlan, Ind.

Garden City, Gulf & Northern.—An officer writes that contracts have been given to A. J. Canady, Scott City, Kan., and to S. S. Shaw, Garden City, for building extensions of this road. The plans call for an extension from the present northern terminus at Scott City, north to the Union Pacific in the northern part of Logan county, 55 miles, and another extension from Garden City south to Liberal, about 70 miles. (Sept. 9, p. 482.)

Gilmore & Pittsburgh.—An officer writes that work is about completed on the line as located from Armstead, Mont., west to Salmon City and to Gilmore, Idaho. The line to Salmon City is now open for business and it is expected to open the remaining section to Gilmore about October 15. No plans for any immediate new construction work have been made. (July 3, p. 1390.)

Gulf Coast & Provident City.—An officer is quoted as saying that financial arrangements have been made, and work on the line is to be started at once. The projected route is from Pierce, Tex., north to connect with an east and west line to be built from Glen Flora, west to Provident City. E. Reinbold, chairman, Kansas City, Mo. (April 22, p. 1064.)

Gulf, Colorado & Santa Fe.—An officer writes regarding the reports that the Santa Fe is seeking an entrance into Waco, Tex., by securing trackage rights over an existing line or building a new line, that for the present at least the company does not contemplate an entrance into Waco. The proposition has been under advisement for some time. (A., T. & S. F., Sept. 9, p. 482.)

Gulf, Delta & Northwest.—An officer writes that a charter has been granted this company and surveys are made, but that it is undecided when work will be started. The plans call for a line from Port Barre, La., north to Moreauville, 35 miles. O. H. Williams, 602 Maison Blanche, New Orleans, may be addressed.

Hagerman Valley & Western.—Incorporated in Idaho with $200,000 capital and office at Hagerman, Lincoln county, Idaho, to build railways in Idaho. The directors include: J. W. Morton, H. A. Stroud, E. M. Bell, H. E. Secor and A. H. Brailsford.

Hampden Railroad.—The Massachusets Board of Railroad Commissioners has granted this company a certificate of public exigency for building the proposed line to Bondsville, about 25 miles. At Bondsville connection is to be made with the Massachusetts division of the Boston & Maine and the New London Northern division of the Grand Trunk system. R. D. Gillett, Westfield, and F. T. Ley, Springfield, are directors. (July 29, p. 205.)

Hudson & Manhattan.—See an item in General News regarding proposal of this company to build a new subway under Broadway, New York City.

International & Great Northern.—An officer writes that a preliminary survey was made by the I. & G. N. down the Nueces river for 15 miles for some large land owners. It has not yet been decided to build a line through this section.

Iowa Roads.—According to press reports, surveys are being made from Des Moines, Ia., southeast to Carlisle, thence to Knoxville or Dallas, and southward to Chariton, continuing south to Seymour or Allerton. It is thought that this is a project of the Rock Island. H. L. Jackson, Hammond, Ind., is in charge of the surveys.

Fairchild & Northeastern.—An officer writes that contracts will probably be let next spring for building an extension from Nix Corners, Wis., southwest via Brackett to Caryville, about 40 miles. The principal revenue of the line will be derived from hauling grain, live stock and lumber. (Aug. 16, p. 332.)

Lackawanna Railroad Co. of New Jersey.—See Delaware, Lackawanna & Western.

Lake Arthur, Jennings & Northern.—According to press reports, surveys are now being made for this line. The projected route is from Jennings, La., north to Alexandria. B. B. Bliss, E. P. Fox, general manager, Jennings. (April 29, p. 1114.)

Midland Pennsylvania.—Construction work is said to have been started by this company, which was recently organized in Pennsylvania, with a capital of $430,000. The projected route is from Millersburg, Dauphin county, Pa., northeast via Gratz and Gordon to Ashland, in Schuylkill county, 44 miles. W. E. Harrington, president, Philadelphia. (Aug. 12, p. 294.)

Minneapolis, St. Paul & Sault Ste. Marie.—Work is said to have been started on new division terminals at a point about

a mile from the Stevens Point, Wis., passenger station. Tracks will be laid as far as the Plover river.

MORGAN'S, LOUISIANA & TEXAS.—See Southern Pacific.

NEW YORK, NEW HAVEN & HARTFORD.—An officer writes that this company has under consideration the question of double-tracking a section of the line between Fall River, Mass., and Warren. Surveys have not yet been completed and contracts for the work will not be let for some time to come. The work includes grade reduction, improvements of alinement and the elimination of a number of grade crossings. Under an agreement with the city of Fall River, a new combination double-track railway and highway bridge will be built, replacing the present single-track structure known as the Slades Ferry bridge. The general plan of improvement includes a tunnel under a portion of the city of Fall River, to connect with the Watuppa branch, thus establishing a continuous route between Providence, R. I., Fall River, Mass., and New Bedford.

NEW YORK, ONTARIO & WESTERN.—A contract is said to have been given to the McDonald Construction Co., Scranton, Pa., for double-tracking the line between Pleasant Mount, Pa., and Winwood, nine miles, also from Winwood to Hancock, N. Y., an additional nine miles. The contract is said to be valued at $400,000. It is understood that the company intends to eventually double-track the entire branch from Hancock to Scranton.

NEW YORK, WESTCHESTER & BOSTON.—This company has completed about 65 per cent. of the line between West Farms (New York City) and Mount Vernon, exclusive of the rails and power. About 18 miles has been finished or is under construction. It is expected that the line will be finished in about one year between West Farms and Mount Vernon, and on the branch line from Mount Vernon to White Plains. (Aug. 26, p. 373.)

NORFOLK & WESTERN.—The report of this company for the year ended June 30, 1910, shows that work is now under way on branch lines and extensions as follows: Petersburg Belt, to be 8.91 miles long, with connecting tracks aggregating 1.69 miles; this line is now under construction from Poe, Va., to a point west of Addison on the main line, thence continuing around to the south of the city of Petersburg. The new line will form a second track between the points named, and will furnish a low-grade line for through traffic and for interchange of business with the Atlantic Coast Line and the Seaboard Air Line, avoiding the heavy grades and curvatures of the old line through Petersburg. It is expected that the work will be finished and the line ready for business early in 1911. The Allisonia branch, 0.6 mile, has been built to an iron ore tipple on Big Red Creek, near Allisonia, Va. Right-of-way has been secured for extending the Dry Fork branch 1.72 miles, from Canebrake, W. Va., to a point below the mouth of Beech creek, and 0.8 mile is under construction to Operation No. 4 of the New River-Pocahontas Consolidated Coal Co. Right-of-way has been secured for the Beech Creek branch from the Dry Fork branch to the Indian Creek branch at the Virginia state line, 1.56 miles, also for the Indian Creek branch from the Beech Creek branch at the West Virginia state line to Cedar Bluff, Va., on the Clinch Valley district, 12.22 miles, and for a Y connection, 0.37 mile, at Cedar Bluff. Construction work is under way on 3.22 miles at Summit tunnel. The Dry Fork branch and connections will form a continuous line from Jaeger, W. Va., to Cedar Bluff and will provide a western outlet to the coal lands on the Clinch Valley district. Right-of-way for the North Fork branch of the Tug Fork branch from Jeanette, W. Va., 4.31 miles, with a branch, 0.87 mile, to projected coal operations, has been arranged for. Satisfactory progress has been made on the Winston-Salem Southbound, building from Winston-Salem, N. C., to Wadesboro, about 88 miles. On this line 83 per cent. of the grading, 78 per cent. of the masonry work and 75 miles of the roadbed are finished, and 18 miles of main track has been laid. The line is being built jointly with the Atlantic Coast Line. Right-of-way is being secured for extensions of the Guyandotte & Tug Fork Railroad and connections. During the year 75.87 miles of main track was laid with 85-lb. rail, 17 miles of the Durham district with resawed 75-lb. rail and 7.02 miles of the Clinch Valley district with resawed 85-lb. rail. Additions were made to division yards at Williamson, W. Va.; East Portsmouth, Ohio, and Columbus. This work included an entirely new eastbound yard at East Portsmouth. A number of passenger and freight stations were built or enlarged, some power houses for interlocking and block signal plants were built, and some shop extension work was carried out.

NORTHWESTERN PACIFIC.—This company is said to be asking for bids to build about 30 miles of line between the northern and the southern sections of the line. Work is already under way from Willits, Cal., north to Outlet Creek. One of the sections to be let is from Outlet Creek, north to the Covelo bridge, and the other section is from Dyerville, on the northern section, south to Fort Seward. On this section the Island Mountain tunnel will involve the heaviest construction on the line.

OREGON TRUNK RAILWAY.—This company has filed maps in Oregon for a line from a point at the summit of the Cascade mountains in central Oregon, westerly, passing north of Fish lake, thence southwesterly to a point near Eagle Point, in Jackson county. (Sept. 2, p. 440.)

PENNSYLVANIA ROADS (ELECTRIC).—A company is being organized by Philadelphia capitalists, with $180,000 capital, to build an electric line from Dillsburg, Pa., southeast to Dover, 14 miles.

ST. LOUIS, BROWNSVILLE & MEXICO.—Work has been finished on the extension of the Tres Palacios branch and it is expected that train service will be started this week between Buckeye, Tex., and Collegeport, about 17 miles. (Aug. 5, p. 263.)

ST. LOUIS SOUTHWESTERN.—Work is said to have been started on an extension from Hamilton, Tex., west to Comanche, 32 miles. The grading contract has been let to Thompson & Scott, St. Louis, Mo., who have sublet grading work on 10 miles to J. S. McSpadden. (July 1, p. 54.)

SOUTHERN PACIFIC.—According to press reports the line under construction for several years for Morgan's Louisiana & Texas, from Lafayette, La., northeast to Port Allen (opposite Baton Rouge), will be finished and put in operation by October 1. The work has been considerably delayed in overcoming the difficulties encountered in crossing Atchafalaya river. (June 17, p. 1568.)

TEMPLE-NORTHWESTERN.—Track laying is said to have been started from Temple, Tex., northwest. It is expected that the first 10 miles will be finished by November. The line is eventually to be extended northwest to Benjamin, in Knox county, a total of about 210 miles air line. W. J. McDaniel, president, and W. E. Dozier, chief engineer, Temple. (Sept. 2, p. 440.)

TEXAS CENTRAL.—Renewal work on this road, which has been under way for some time, is nearing completion. About 35 miles of the line has been laid with 80-lb. rail, replacing lighter sections. This required about 5,000 tons of rail. Rapid progress is being made on the new branch from De Leon, Tex., to Cross Plains, about 41 miles. (July 1, p. 54.)

TEXAS ROADS.—See an item in General News regarding new lines in Texas.

WHEELING & LAKE ERIE.—The report of this company for the year ended June 30, 1910, under date of September 1, shows that grade reduction work is now under way on the Toledo division. This work between Bolivar, Ohio, and Zoar is finished except some small ballasting and surfacing, and replacing with stone some of the temporary bridge seats on bridges that were raised. Work has been under way for several months cutting down the summit between Pryor and Smithville, the material being used to lift the track on a long fill between these stations. Similar work is under way between Smithville and Creston, also between Wellington and Brighton. The work of removing the company's tracks from the C. & P. right-of-way far enough to allow that company to lay second track, has been finished. This included putting up about 1½ miles of riprap wall along the Ohio river. About 87,000 cu. yds. of fill was placed. The relocation of line and yard tracks at Cleveland was finished during the year. On the Sugar Creek & Northern, 5 miles of second track was laid and five passing tracks, each 3,600 ft. long, a total of 3.41 miles. In the east yard ¼ of the track laying was finished and all the track laying in the west yard. The total track laid during the year was: 26 new industrial sidings, aggregating 4.33 miles, 3.41 miles of main tracks, 5.13 miles of passing tracks, 0.65 mile of team tracks and 22.22 miles of yard and other company tracks.

Railway Financial News.

New Incorporations, Surveys, Etc.

Central of Georgia.—See editorial comments on the annual report in another column.

Chicago & Alton.—A press despatch says that negotiations have about been completed for the purchase by the Chicago & Alton of the Toluca, Marquette & Northern, now in the hands of receivers. The T., M. & N. runs from Rutland, Ill., to Granville, 27 miles.

Chicago, Rock Island & Pacific.—The C., R. I. & P. Railway has declared a quarterly dividend of 1¼ per cent., which compares with a quarterly dividend declared at this time last year of 1¾ per cent. Three months ago 1 per cent. was declared. It is explained that the 1¼ per cent. dividend is sufficient to meet the interest charges of the C., R. I. & P. Railroad since the retirement of the St. Louis & San Francisco bonds.

Delaware, Lackawanna & Western.—Stockholders of the Newark & Bloomfield, a four-mile road running from Newark Junction, N. J., to Montclair and operated under lease by the Delaware, Lackawanna & Western, have voted to increase the capital stock from $103,850 to $1,600,000. The D., L. & W. owns $97,700 of the stock at present outstanding. The proceeds of the sale of the new stock is to be used for improvements. There are no bonds having a lien on the road, and the lease to the D., L. & W. provides for 6 per cent. dividends on the stock.

Duluth, South Shore & Atlantic.—For the fiscal year ended June 30, 1910, the company, with an average mileage operated of 607 miles, had total operating revenue of $3,302,147, comparing with total operating revenues of $2,719,338 in 1909. Operating expenses amounted last year to $2,269,248, comparing with operating expenses in 1909 of $1,979,518. After the payment of taxes in 1910 of $225,918, and in 1909 of $203,600, there was left net operating income of $815,572 in 1910 and $544,086 in 1909. After the payment of interest on bonds and other interest and rentals, the net corporate loss amounted to $351,715 in 1910 and to $201,447 in 1909. The larger loss in 1910 is accounted for by the fact that the company received less income from other sources of operation than in 1909 and paid very much greater sums for rentals, etc. In 1909 the other deductions (rentals, etc.) amounted to $28,937, and in 1910 other deductions amounted to $352,391.

Of the total operating revenue last year, $1,723,312 was furnished by freight and $415,438 by revenue from the carriage of iron ore. The increase in freight revenue was about evenly divided proportionately between iron ore freight and other freight, and the toal increase amounted to $504,661. Passenger revenue last year amounted to $988,367 and in 1909 to $915,124.

Under operating expenses, maintenance of way cost $527,683 in 1910, an increase of $82,402 over 1909; maintenance of equipment cost $361,459, an increase of $33,668; traffic expenses cost $107,909, an increase of $7,025, and transportation expenses cost $1,193,180, an increase of $166,109.

The total number of tons of freight carried one mile amounted to 249,466,756 tons, comparing with 171,817,333 tons in 1909. The average haul of through freight was 111 miles, as compared with 98 miles in 1909; but the average haul of local freight was 33 miles in 1910 and 35 miles in 1909. The average receipts per ton per mile for haul freight amounted to 8.57 mills in 1910 and to 9.51 mills in 1909. The number of passengers carried one mile totaled 39,231,325 in 1910 and 37,137,717 in 1909. The average distance carried was 54.5 miles in 1910 and 52.5 miles in 1909. The average receipts per passenger per mile for all passengers were 2.519 cents in 1910 and 2.464 cents in 1909. Ores furnished 49 per cent. of the total tonnage carried in 1910, comparing with 38 per cent. of the total tonnage in 1909. Lumber and other forest products furnished 19 per cent. in 1910, as against 26 per cent. in 1909.

Kansas City Southern.—See an item in regard to this company in Traffic News.

Maine Central.—This company has bought the property of the Sebasticook & Moosehead. The line runs from Pittsfield, Me., to Mainstream, 15 miles. The property was presumably sold under foreciosure.

Minneapolis, St. Paul & Sault Ste. Marie.—The company is to issue $3,600,000 new bonds. The fact that this new issue of bonds was approved by the directors at a meeting held about two weeks ago has just been made public.

Mobile Terminal & Railway Co.—F. J. Lisman & Co., New York, have bought $175,000 of the company's first mortgage 6 per cent. bonds of September 1, 1910-1935, and are offering these bonds at par. Principal and interest are guaranteed jointly by the Alabama, Tennessee & Northern and the Tombigbee Valley. The Terminal company was incorporated in Alabama to buy 24 acres of real estate fronting on Mobile harbor. The company has $500,000 authorized stock outstanding and $500,000 first mortgage 6 per cent. bonds, of which the $175,000 bought by the New York bankers is all that has been issued.

Newark & Bloomfield.—See Delaware, Lackawanna & Western.

New Orleans & Northeastern.—An annual dividend of 6½ per cent. was paid on September 3. In 1909 5 per cent. was paid and in 1908 4 per cent. was paid.

New York & Harlem.—The directors have declared a semi-annual dividend of 1½ per cent., payable Oct. 1. This is the dividend payable out of rental received for the Fourth avenue lines from the Metropolitan Street Railway. The rental of $400,000 a year is equivalent to 4 per cent. on the company's stock, and formerly that rate was paid, but the directors have decided to accumulate a sufficient fund to provide for payment of certain taxes in dispute with the city if it becomes necessary to do so. This is the first dividend payable out of the Fourth avenue street car lines for a year. There has been no interruption, of course, in the 10 per cent. dividend paid as rental by the New York Central & Hudson River.

Oregon Short Line.—Stockholders (which means the Union Pacific and the directors) will be asked to vote on October 12 to authorize an increase of the capital stock from $27,460,100 to $100,000,000.

San Antonio & Rio Grande.—F. W. Matthews has been appointed receiver of this road, which runs from San Juan, Tex., to Chapin, about 10 miles.

Sebasticook & Moosehead.—See Maine Central.

Southern Indiana.—The reorganization plan, as outlined in these columns in our issue of August 12, page 295, has met by no objection from any of the stockholders, the *Commercial and Financial Chronicle* says, and has practically been adopted. The *Chronicle* says that negotiations are pending for the sale to eastern parties of $2,100,000 of the new first mortgage bonds at something above the price at which Chicago banks were willing to underwrite the bonds. From the proceeds of the sale the floating debt will be paid and $200,000 left in the treasury.

Tennessee Central.—See an item in regard to this company in Traffic News.

Toluca, Marquette & Northern.—See Chicago & Alton.

Union Pacific.—See Oregon Short Line.

Vermont Valley Railroad.—This subsidiary of the Boston & Maine has sold to Lee, Higginson & Co., Boston, $1,500,000 first mortgage 4½ per cent. bonds, of October 1, 1910-1940. These bonds are issued to refund $800,000 first mortgage 5 per cent. bonds coming due October 1, and also to provide for the payment of certain construction work financed by the Boston & Maine. The bankers are offering the bonds, which are a legal investment in Massachusetts, Connecticut, New Hampshire and Maine, at 104½, to yield 4.25 per cent.

Wabash-Pittsburgh Terminal.—The receivers have been authorized by the court to bring a suit against the managers of the Pittsburgh-Toledo syndicate, who financed the building of the Wabash-Pittsburgh Terminal. The suit will be for an accounting for money received from the sale of Wabash-Pittsburgh Terminal bonds.

Wheeling & Lake Erie.—See editorial comments on the annual report in another column.

Supply Trade Section.

John B. Milliken, comptroller of the Crocker-Wheeler Company, Ampere, N. J., has accepted a position as treasurer of the Yale & Towne Manufacturing Company, New York, with headquarters at New York.

The Chicago Steel Car Co., Chicago, has filed a trust deed covering $75,000 in bonds, the proceeds to be used in extensions and improvements to the company's plant at Harvey, Ill., made necessary by demands for an increased output.

To facilitate handling its rapidly increasing business in the Middle West, the Rockwell Furnace Company, New York, has opened a branch office in the Fisher building, Chicago, with A. L. Stevens, an experienced furnace engineer, in charge.

The annual report of the Westinghouse Air Brake Company, New York, just issued, for the year ended July 31, shows net earnings of $4,653,102, as against $2,039,273 in 1909. After charging off $429,824 for depreciation, etc., a surplus of $4,223,278 remained, as against $1,920,557 in 1909.

The Baldwin Locomotive Works, Philadelphia, Pa., request the announcement that a man giving the name of N. A. Nathan, who is operating among certain western manufacturers, claiming connection with the acounting department of the Baldwin Locomotive Works, has no connection with that company.

The Griffin Wheel Company, Chicago, has let the contract to Kelly Bros., Tacoma, Wash., for building an addition to the Tacoma plant. The addition to the main shop will be 436 ft. long, 100 ft. wide, and will cost about $49,000 without equipment. Several small accessory buildings are included in the contract.

Charles Goble, mechanical superintendent of the Railway Audit & Inspection Company, Philadelphia, Pa., has been made district manager at Chicago, with office in the Calumet building. Mr. Goble has been with this company for the past five years, previous to which he was interested in electric and steam railway enterprises.

The Glacier Metal Company, of Richmond, Va., is placing on the market a new ribbonized plastic metallic packing for steam, air, water, gas, ammonia, etc. This packing is satisfactorily made, from an alloy of white metal, into fine shreds or ribbons, and is therefore very pliable. It will not score the rods nor show corrosion when in contact with acids.

The Isthmian Canal Commission will receive bids until October 14 for condenser, motor-driven engine lathe, valve-reseating machine, snatch blocks, punches and dies, rivet sets, machine bits, cold-shuts for steam shovels, coupler knuckle pins, manganese-steel plates, clam-shell bucket, electric fans, water gages, fire brick, lumber, etc. (Cir. No. 606.)

The Pawling & Harnischfeger Company, Milwaukee, Wis., makers of electric traveling cranes and hoists, announces that Arthur Fritsch has been appointed manager of the Chicago office, located in the Monadnock block, to succeed W. E. Kreamer, resigned. Mr. Fritsch was formerly connected with the engineering and sales department of the Allis Chalmers Company, Milwaukee, Wis.

The Association of Railway Electrical Supply Manufacturers announces that the top floor of the La Salle hotel, Chicago, has been reserved for exhibits at the convention of the Association of Railway Electrical Engineers to be held at that place September 27-30. Particulars can be obtained by writing to W. E. Ballantine, in charge of exhibits, care of Willard Storage Battery Company, 320 Dearborn street, Chicago.

Three-quarters of the fiscal year of the Western Electric Company, New York, which closed with August last, indicated that there has been no occasion to revise the estimate of a gross business, $61,000,000, for the year, which estimate was made last February. The gains which this company has recorded consistently during the current year continue. The month of August showed an increase in business equal to a gain of 50 per cent. over the corresponding month of 1909, and this was also the case of July over the preceding July. The probable showing of $61,000,000 for the present year is exceeded only by 1906, when gross sales were somewhat more than $69,000,000.

The Hicks Locomotive & Car Works, Chicago, was, on September 19, placed in the hands of the Commercial Trust & Savings Bank, as receiver. The Chicago officers of the company explain that it has suffered, together with other railway equipment companies, in the slump of business during the last three years. The receiver will continue to operate the plant, and it is expected that it will soon be working full force.

Owing to the great increase in business in the vicinity of Atlanta, Ga., and Rochester, N. Y., the H. W. Johns-Manville Company, New York, has recently opened new offices in each of these cities. The Atlanta office is in the Empire building, with W. F. Johns, who has been traveling in this territory for the company for a number of years, in charge. The Rochester office is at 725 Chamber of Commerce, with H. P. Domine, formerly with the Buffalo branch of the company, in charge.

The Vulcan Iron Works, Wilkes-Barre, Pa., have received the following locomotive orders: Marion Steam Shovel Co., Cleveland, Ohio, one 18-in. x 24-in. four-wheel switcher; Edward J. Gay Planting & Manufacturing Co., Plaquemine, La., one 10-in. x 16-in. Forney plantation locomotive; American Hominy Co., Indianapolis, Ind., one 15-in. x 24-in. four-wheel saddle tank switcher; the Berlin Mills Co., Portland, Me., one 17-in. x 24-in. double end locomotive, and the Lehigh Valley Coal Co., New York, one 10-in. x 16-in. six-wheel saddle tank locomotive.

The U. S. Indestructible Gasket Company, 50 Church street, New York, is building a new plant in Brooklyn, N. Y., which will have a space for machines 10 ft. wide and 500 ft. long. The building is of semi-fireproof construction, steel sash being used, and well lighted. This new plant affords greatly increased facilities for the manufacture of the company's products, consisting of gaskets, washers, discs, rings, multiple disc pump valves, diaphragms, stampings, formings, punchings, dies and specialties of all kinds, including corrugated, flat and grooved copper, lead, steel, bronze, Ames alloy, indestructibleite, Norway and Swedish iron, monel metal, sparkite, copper-asbestos, wire, paper and other gaskets, also washers, discs, rings and shapes of any metal, fibre, abestos, leather, cork, mica, felt, rawhide, canvas, etc., of every size, shape and thickness.

W. B. Doddridge, whose work as a railway expert at St. Louis, Mo., has attracted considerable attention, began railway work as telegraph operator on the Union Pacific in 1867. The end of the line at that time was at North Platte, Neb., and Mr. Doddridge remained in the position of operator during the construction of the line to a connection with the Central Pacific at Promintory. Later he was made agent at Ogden, Utah, which was at that time the most important junction in the West. Subsequently he was made superintendent of the western division of the Union Pacific, from Green River to Ogden, and later general superintendent, having in charge the construction of the Utah & Northern into Montana. This work was followed by the building of the Oregon Short Line from Granger, Wyo., to Huntington, Ore. In 1884 Mr. Doddridge left railway work and became associated with Marcus Daly as manager of construction and operation of the Anaconda smelter in Montana. In 1886 he returned to railway work as superintendent of the Missouri Pacific lines in northern Kansas. In 1889 he became general manager of what is now the St. Louis Southwestern, with office in St. Louis. In 1893 he was made general manager of the Pacific system of the same road, which position he held until 1900. Since that time Mr. Doddridge has been engaged in expert work, including the making of physical and business examinations of railway and other properties, both for railway companies and financial interests, and also acting as expert witness for the railway companies in the recent injunction suits in the western states involving two-cent passenger rate

matters and maximum freight bills. He is also at the present time receiver of the North American Lead Company of Missouri, knowledge of which business he obtained while manager of the Anaconda smelter. His office is at 3965 Westminister place.

Track Supply Association Organized.

A meeting of representatives of supply concerns which are interested in proper exhibits being made in connection with the meetings of the Roadmasters and Maintenance of Way Association was held in Chicago on September 16 to consider plans for making exhibits in connection with the meeting of this association at St. Louis in 1911. On motion of J. M. Holloway, of the American Steel & Wire Company, a resolution was adopted providing for the election of a president, vice-president and secretary-treasurer, and an executive committee composed of these officers and two other members of the proposed association, who are instructed to confer with the Railway Appliances Association with a view to securing its approval or disapproval of this plan. The resolution provides that if the Railway Appliances Association does not care to exhibit at the meetings of the Roadmasters, this new organization shall do so.

The following officers of the new association were elected: President, William Goldie, Pittsburgh; vice-president, J. M. Holloway, Chicago; secretary-treasurer, A. C. Holloway, Chicago; members executive committee, John McKinnon, Kalamazoo, Mich., and W. C. Kidd, Hilburn, N. Y. The concerns represented at the meeting were those which exhibited at the meeting of the Roadmasters' Association in Chicago last week, a list of which is printed elsewhere in this issue.

TRADE PUBLICATIONS.

Great Northern.—The Great Northern's 16-page booklet on colonist fares to the northwest also includes descriptive matter and maps.

Great Northern.—A booklet, describing the advantages of traveling on the Oriental Limited has been issued by the company. There is also an itinerary in the booklet which will prove a convenient reminder of train connections.

Northern Pacific.—A small wall card has been issued by the traffic department of the Northern Pacific, bearing a map of the line, and also a large half-tone impression of a Mallet locomotive such as are used on the mountain divisions.

Precision Instruments.—Kolesch & Co., New York, have just published a circular regarding the Richter drawing instruments, which should be of interest to the engineering profession generally, as it contains illustrations, prices, etc., of a large number of drawing instruments.

Concrete Mixer.—The Chicago Concrete Machinery Co., Milwaukee, Wis., has issued a 10-page pamphlet describing the various styles of Chicago concrete mixers. A convenient table giving capacities, outputs, power consumption and weights for the various sizes is included.

The Mechanigraph.—Topping Brothers, New York, have just issued an attractive paper board book describing their mechanigraph, a device used for making transparent a mechanical drawing paper, so that blueprints may be made direct from it, doing away with the necessity of making a tracing.

Chicago & North Western.—The passenger department of the Chicago & North Western has issued four pamphlets, giving facts about colonist rates to the Pacific coast, improved train service to southern California, low fares to the West and Northwest and through passenger schedules from Chicago.

Electric Interlocking System.—Bulletin No. 49, just received from the Union Switch & Signal Co., Swissvale, Pa., on the subject of the multiple unit electric interlocking system, contains a detailed description which should be of particular interest to those in the signal engineering departments of railways.

Chicago, Burlington & Quincy.—A folder has been issued by the passenger department of the Burlington Route advertising the eighteenth National Irrigation Congress, to be held in Pueblo, Colo., September 26-30, 1910. The information it contains regarding the congress and the city will be of interest to all prospective attendants.

Lifting Magnets.—The Electric Controller & Manufacturing Co., Cleveland, Ohio, has issued a pamphlet describing, with photographs and drawings, the lifting magnets which it manufactures. A large circular accompanies the catalogue and describes the Dinkey ventilated controllers, made for both direct and alternating currents.

Electrical Equipment.—The General Electric Company, Schenectady, N. Y., in Bulletin 4754, describes in detail its d.c. and a.c. motors for use in steel mills; in Bulletin 4761 its Sprague-General Electric Type M control system, which bulletin supersedes the previous one on this subject; and in 4764, its line of Mazda compensator and low-volt lamps.

Vanadium Steel.—The Carnegie Steel Co., Pittsburgh, Pa., has just issued a pamphlet containing some general information about the vanadium steel which it manufactures. Arranged in tabular form are shown the 14 types of this steel, giving the application of the different types and the approximate heat treatment in each case. The physical properties are also given.

Rotary Snow Plow.—The American Locomotive Company, New York, has just issued bulletin No. 1005, which contains information regarding the use of rotary snow plows on a number of railways. The information given was obtained from the railway officers and gives their experience with this equipment. A number of half-tone illustrations show these plows in operation.

Electric Equipment.—The General Electric Co., Schenectady, N. Y., has issued bulletin No. 4749, on alternating current switchboard panels; bulletin No. 4755, on the electrification of the Cascade tunnel of the Great Northern Railway; bulletin No. 4763, on the isolated plant, direct-current combination generator and feeder panels—which supersedes previous bulletins on this subject; and bulletin No. 4767, on large motors for steel mills.

Locks and Hardware.—A new loose-leaf catalogue, bound in green cloth, with red leather back and corners and gold stamping, containing about 900 pages, with more than 4,000 illustrations especially made for this work, and printed on heavy paper, has just been issued by the Yale & Towne Manufacturing Co., New York. This is a general catalogue, covering the company's locks and hardware, including Yale turret locks, Yale monolocks, door closing devices and miscellaneous hardware.

RAILWAY STRUCTURES.

Bloomington, Ill.—The Chicago & Alton advises that the work to be done this year includes the building of a 44-stall roundhouse, which will be 430 ft. in diameter; a 600-ton coaling station, two 100,000-gal. water tanks, connected to four new 12-in. water cranes, and two double-track cinder pits 200 ft. long. The new roundhouse adjoins one of the old roundhouses and will be approached by seven yard tracks about 1,650 ft. long. Other improvements are planned but will not be started this year.

Cadillac, Mich.—The Ann Arbor is asking for bids until October 10 for building a one-story, 165-ft. x 35-ft. brick, stone or concrete passenger station to cost about $20,000.

Cincinnati, Ohio.—The Chesapeake & Ohio has let the contract to a local contractor for filling the long trestle over which the road enters the city.

Holdredge, Neb.—The Chicago, Burlington & Quincy has let the contract to T. J. Leake & Co., Chicago, for building the passenger station mentioned in the *Railway Age Gazette* of May 20. The cost is given as $35,000.

Kansas City, Mo.—The Missouri Pacific is building a locomotive repair shop, 153 ft. x 334 ft., to cost about $136,000.

Reading, Pa.—Plans are said to have been approved for building a bridge over the Lebanon Valley Railroad at Tulpehochen street.

Tacoma, Wash.—The Chicago, Milwaukee & Puget Sound is having final plans made for the passenger station to be built in Tacoma. All necessary property has been secured and temporary structures provided to care for the business until the new building is ready.

Late News.

The items in this column were received after the classified departments were closed.

In a butting collision of electric cars on the Fort Wayne & Wabash Valley interurban road, 7 miles north of Bluffton, Ind., on Wednesday morning last, 42 persons were killed and a large number injured. The southbound car carried no passengers, but the northbound was filled with people from Bluffton destined to a fair at Fort Wayne. The cars met on a curve at full speed, and southbound was forced half way through the length of the northbound. Conductor E. A. Spillman, of the northbound car, was seriously injured, but immediately ran back around the curve and stuck a flag in the ground to stop a following car.

In the hearing now being carried on before the New York Public Service Commission, of New York, Second district, it has been brought out that the Buffalo, Rochester & Eastern has placed in the possession of James F. Jackson, former chairman of the Massachusetts Board of Railroad Commissioners, facts and information to show that the promoters of the Buffalo, Rochester & Eastern are financially able to carry out their plans for building a road from Buffalo to Albany. The names of the people who are back of this project are not made public, but Mr. Jackson filed an affidavit in which he says that the information filed with him showed unquestionably that if the New York Public Service Commission would grant a certificate of necessity and convenience to the B., R. & E. they would be able to build the proposed line.

In the freight-rate hearing at Chicago on Wednesday Mr. Park estimated that 25 or 30 millions ought to be spent on the Illinois Central to put it in condition satisfactorily to serve the public, besides five millions for automatic block signals, the maintenance of which would cost $500,000 a year. William Ellis, counsel for the Chicago, Milwaukee & St. Paul, said that its book cost in 1901 was $224,228,833, on which the net return earned was 6.4 per cent. The book cost in 1910 was $280,828,179, and the net return was 5.76 per cent. The capitalization in 1901 was $227,421,700, and the net return was 6.4 per cent. The capitalization in 1910 was $424,813,231, and the net return 6 per cent. The net return includes interest received on securities owned and some other income not received from operation. The estimated cost of reproducing the property, based on valuations made by the state commissions in Wisconsin, Minnesota and South Dakota, would be $293,318,963, or $40,203 per mile. He thought that the cost of reproduction would really be more than this. He gave very complete figures, showing costs and results of operation for the years 1901 to 1910, inclusive. He showed that from 1901 to 1910 the expenses had increased $7,753,456, solely because of increases in unit costs of labor and materials. In other words, if the road had done only the same business in 1910 as it did in 1901 the freight expenses, owing to the increases in unit costs, would have been this much greater.

In a suit brought by the stockholders to make permanent an injunction against the railways of Minnesota, forbidding them to make the freight rate reductions ordered by the State Railroad and Warehouse Commission and the State legislature, the master in chancery, appointed by the United States Circuit Court, finds that the rates prescribed are both confiscatory, and unconstitutional, in that they are an interference with interstate commerce. The Minnesota legislature passed a law three years ago fixing passenger fares at 2 cents a mile and making drastic reductions in freight rates. A temporary injunction was granted restraining the company from putting into effect the reduced freight rates, but the passenger rates had already been put in effect when the suit was brought. The present finding of the master, if sustained by the courts, will make permanent this injunction. According to newspaper accounts of the master's findings, he fixes 7 per cent. as a fair return for a railway to earn on the investment in its property, and he finds that the Great Northern, the Northern Pacific and seven other roads could not earn this return on their investments if the reductions in passenger rates and freight rates were made. The newspaper accounts say that the master accepted as correct the valuation of the Northern Pacific and the Great Northern made by these companies themselves, in preference to taking the valuation made by the State Railroad and Warehouse Commission, which was very much lower.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Atlanta & West Point is said to be in the market for two locomotives. This item is not confirmed.

The Central Railway of Brazil has ordered 10 Mallet locomotives from the American Locomotive Company.

The St. Louis & O'Fallon has ordered one prairie type freight locomotive from the American Locomotive Company.

The Pere Marquette has ordered 10 consolidation freight locomotives from the American Locomotive Company.

The Paulista Railway of Brazil has ordered one 10-wheel passenger locomotive from the American Locomotive Company.

The Brownwood Southwestern, reported in the *Railway Age Gazette* of April 22 as being in the market for a number of locomotives, advises that it is not now in the market for this equipment, but that it expects to be in the near future.

The Baltimore & Ohio order for 50 Mikado locomotives, as reported in the *Railway Age Gazette* of July 8, was subsequently changed to 40 Mikado and 10 Pacific, the order for which latter is being wrongly considered as a separate one.

The St. Paul & Des Moines, reported in the *Railway Age Gazette* of August 5 as having ordered two consolidation locomotives from the Lima Locomotive & Machine Co., has increased this order to three. The details of the additional engine are the same as those given in the *Railway Age Gazette* of August 12.

CAR BUILDING.

The Chicago, Burlington & Quincy is in the market for six all steel postal cars.

The Manistee & Grand Rapids is in the market for one passenger-horse car.

The Pennsylvania Lines West are said to be in the market for freight equipment. This item is not confirmed.

The New York Central & Hudson River has ordered 10 all-steel postal and 10 all-steel combination postal and baggage cars from the Pressed Steel Car Company.

The Kansas City, Mexico & Orient, reported in the *Railway Age Gazette* of August 19 as being in the market for 11 passenger cars, advises that the ordering of this equipment has been indefinitely deferred.

The Winston-Salem Southbound will receive five new cabin cars from the Norfolk & Western. The latter company is also preparing plans and obtaining prices on 100 box cars and 50 gondola cars for the Winston-Salem.

The Carolina, Clinchfield & Ohio, reported in the *Railway Age Gazette* of July 8 as being in the market for 250 box and 100 stock cars, advises that it has received bids on this equipment, and that the order will probably be placed in the near future.

The San Antonio & Aransas Pass, reported in the *Railway Age Gazette* of September 2 as in the market for four passenger cars, has ordered two 70-ft. combination cars from the Hicks Locomotive & Car Works and two similar cars from the American Car & Foundry Company.

The New England Coal & Coke Company, Boston, Mass., advises that it is not in the market for the 300 hopper cars, as previously reported in the *Railway Age Gazette.* The report evidently grew out of the fact of this company's desiring to obtain information as to the price of hopper and gondola cars, for which reason figures were requested from several car builders.

MACHINERY AND TOOLS.

The Erie has ordered ore handling machinery for a plant near Cleveland, Ohio. The reported cost is $500,000.

The Chicago, Burlington & Quincy is buying some machine tools, but the orders are not definitely placed as yet.

The Lake Shore & Michigan Southern has ordered the generators for the Elkhart, Ind., shops, and will soon buy motors with a total capacity of 5,000 h.p.

The Isthmian Canal Commission will receive bids until October 14 for a motor-driven engine lathe, valve reseating machine, punches and dies, rivet sets and machine bits. (Cir. No. 606.)

The Missouri Pacific is receiving prices on the following tools: Two horizontal boring machines, 15 vertical boring and turning mills, 11 planers, 6 universal radial drills, 14 drill presses, 5 sensitive drills, 3 wheel lathes, 2 tire turning lathes, 32 engine lathes, 11 turret lathes, 3 tool lathes, 13 bolt lathes, 10 shapers, 5 draw cut shapers, 3 slotters, 2 universal milling machines, 3 double emery grinders, 5 single emery grinders, 2 universal grinders, 3 twist drill grinders, 3 grindstones, 2 hydraulic wheel presses, 5 double head bolt cutters, 3 portable boring bars, 2 valve facing machines, 3 pipe cutting machines, 2 centering and drilling machines, 13 steam hammers, 3 bevel hammers, 4 forging machines, 3 blowers, 8 oil furnaces, 2 flue furnaces, 4 flue cutting machines, 29 blacksmiths' forges, 4 boilermakers' forges, 27 anvils, 3 automatic cut-off saws, 3 rip saws, 6 band saws, 2 belt-driven hack saws, 3 hollow chisel mortisers, 1 chain mortiser, 10 electric motors, 1 double punch and shear, 2 single punch and shears, 2 single shears, 5 single punches, 1 hand power punch, 2 hand power shears, 3 plate bending rolls, 2 timber planers, 1 pneumatic clamp and 1 air compressor.

IRON AND STEEL.

The Central of New Jersey is in the market for 300 tons of bridge steel for a bridge at Bayonne, N. J.

The Chicago, Burlington & Quincy has ordered 700 tons of bridge steel from the American Bridge Co.

The Chicago, Milwaukee & Puget Sound has ordered 9,000 tons of 85-lb. rails from the Lackawanna Steel Co.

The Lake Shore & Michigan Southern has ordered 400 tons of structural steel for a coaling station from the Fort Pitt Iron Works.

The Chicago & North Western has ordered 1,620 tons of bridge steel from the American Bridge Co. for a bridge over the Wisconsin river.

General Conditions in Steel.—Chairman E. H. Gary, of the United States Steel Corporation, this week issued a statement to the effect that there is no justification for the reports of a coming wide-open cut in steel prices. New business being offered at the present time, while large, is less than the total producing capacity of the mills. Although there has been a shading of prices on some commodities by small producers, the principal manufacturers are disposed to maintain fair prices.

An Improved Circuit Tester for Blasters.

One of the principal dangers to which those engaged in blasting are exposed is in encountering unexploded charges of dynamite in the debris. There has always been difficulty in detecting unexploded charges, particularly in floor shots, and until recently the blaster has had to depend on his eye to determine whether all of the holes had fired or not. This is, however, unsatisfactory, because in a number of instances it has been found that the wires and tamping from the hole were not blown out although the dynamite had exploded perfectly. Although the difficulty of locating a missed hole after the blast has been fired still remains, it is now possible for a blaster with care to determine with a great deal of certainty that each of the electric fuses in a blast are in good condition before the shot is fired. A device known as the Du Pont galvanometer or a circuit tester has been invented and placed on the market by the E. I. Du Pont Demours Powder Company, Wilmington, Del., which not only indicates whether an electrical circuit is closed or open, but also indicates within practical limits the amount of electric resistance in the circuit. A blaster may connect the two leading wires to the galvanometer after the holes are all connected up and the galvanometer will indicate not alone whether or not the circuit is complete, but also if there is leakage through bare connections, etc.

It frequently happens that the leading wires become frayed and the insulation removed in places, and this bare wire may fall over an air or steam pipe or a rail, thereby producing a short circuit through the pipe or rail. When the blaster tests his leading wires on the Du Pont galvanometer under these circumstances, it will immediately show a short circuit and the blaster, knowing that the resistance should be calculated from the number of electric fuses he has connected in series, instantly sees that something is wrong and does not attempt to fire the blast until the wires are lifted clear from the iron.

In locating a break or broken wire in a large floor blast, the instrument can be attached successively to the double lines of bore holes at the ends so that the line containing the break is quickly found, after which the electric fuses in each bore hole are gone over separately. It is, of course, not possible to determine positively after a blast has been fired whether the protruding wires from any bore hole are connected to a live electric fuse or not, as the end wires are usually stripped and crumpled together by the blast when it fires, giving an indication of a closed circuit.

FOREIGN RAILWAY NOTES.

The Russian authorities have ordered that only Russians may hold the higher employments on the railways of the west border on which troops would be mobilized in case of war, and as a very large part of this border is Russian Poland, and Poles naturally hold many positions on the railways, this may result in many changes.

The Egyptian State Railways (1,402 miles) earned gross 5 per cent. less in 1909 than the year before, yet at the rate of $11,114 per mile. But it is singular among the railways of the world in having been able to reduce expenses a little, and the net was at the rate of 5.1 per cent. on the capital, against 5.3 in 1908; said capital being at the rate of $73,370 per mile. The government recently took over a 30-inch line 121 miles long from the Nile westward to the Oasis of Kharga. There is no water except at the termini, and tank cars carry a supply for the engines. Its traffic is said to have developed "satisfactorily," but as it took in but $16,200 ($134 per mile) in the seven months it was open, the people on the oasis probably were the "satisfied" party. The new lines in upper Egypt, built chiefly for military purposes, in 1909 for the first time very nearly earned their expenses, falling short but $640. Besides these there are 762 miles of "light railways" in Egypt, of 30-inch and 1 meter gage, owned by three different companies. These earned gross $1,599 and net $672 per mile, their earnings having been 9 per cent. less and their expenses 12 per cent. more than 1908, when they earned net $921 per mile, the decrease in net being 27 per cent.

It is said that three representatives of the British contracting firm of Pearson have just commenced a close survey of the coastwise route from Sevastopol to Alushta, which lies south of Yalta, for the purpose of building a narrow-gage, single-track electric railway. Previous surveys of the same route have been made by Russian engineers, but those are deemed untrustworthy by Messrs. Pearson. The two largest landowners through whose estates the new line will run are M. Ushkoff and Count Steenbock-Fermor, and it is owing to their influence that the Ministerial permission for the construction of the line was obtained. It is understood that the undertaking will be financed entirely by British capital. Much now depends upon the report of Messrs. Pearson's engineer-surveyors. Many of the rocky eminences lying along the Crimean riviera will need to be tunnelled, involving an outlay which may possibly prove prohibitive. At present the overland communication between Sevastopol and Yalta is maintained by an excellent motor car service over the well-macadamized Voronovski chaussée, which was built before the Crimean war.